to 4.5 μ diameter; conidia verrucose, oval or globoid, 4.5 to 5.8 μ by 4.0 to 5.5 μ large, conidial chains divergent; perithecia are formed abundantly, yellow, globose 50 to 120 μ diameter, in which asci abundantly produced; ascus include 8 ascospores; ascospores disc-shape, 4.5 to 6 μ diameter 4 to 5 μ thickness, with distinct furrow and ridges.

Growth on Koji extract-agar slant glaucous green (Rdg., XXXIII, 39″) to deep grayish blue-green, yellow perithecia produced at central area, powderly, reverse and agar yellowish brown.

On Koji extract-gelatin deep slate-olive (Rdg., XLVI, 29‴), andover green (Rdg., XLVII, 25‴) to citron-yellow (Rdg., XVI, 23′) or lemon yellow (Rdg., IV, 23), reverse yellow-ocher (Rdg., XV, 17′) to buffy citrine (Rdg., XVI, 19′), substrate change to pale brownish red, gelatin not liquefied.

Growth on potato good, slightly raised and floccose, light brownish olive (Rdg., XXX, 19″) or Sepia (Rdg., XXIX, 17″); perithecia abundantly produced.

Milk coagulated but not peptonized in 20 days at 27°C.; litmus change to deep blue.

Aspergillus Chevalieri var. *ruber* nov. var.

(Pl. 4—7)

Colonies on Czapek's solution-agar at first glaucous green (Rdg., XXXIII, 39″), then buffy citrine (Rdg., XVI, 19′) or light brownish olive (Rdg., XXX, 19″), margin lemon chrome (Rdg., IV, 21) by perithecia, reverse primuline yellow (Rdg., XVI, 19′) to ochraceous-buff (Rdg., XV, 15′) at margin, chocolate (Rdg., XXVIII, 7″) at central area, brownish soluble pigment produced; conidiophores short, 50 to 150 μ long by 4 to 7 μ rarely up to 12 μ diameter, walls smooth, gradually enlarged upward, with apical flask-shaped vesicles up to 11 to 21 μ rarely 28 μ in diameter, fertile mostly on the upper half, bearing sterigmata in one series, usually 6.5 to 10 μ by 2.5 to 3.5 μ crowded, closely packed with axis roughly parallel to axis of the stalk, chains of conidia divergent; conidia oval or globoid, slightly rough or smooth, 4 to 7 μ by 3 to 5.5 μ, rarely 9 by 6 μ; perithecia globoid, 65 to 170 μ in diameter; ascus contanins 8 ascospores; ascospores 4.5 to 5.5 μ by 3.5 to 4.5 μ, with distinct furrow and crests.

Growth on Koji extract-agar slant at first glaucous green, then

grayish green with solid powderlike appearance, yellowish brown in central area, reverse and agar dark reddish brown.

Koji extract-gelatin not liquefied in 40 days at 15°C., surface of growth dark olive-gray (Rdg., LI, 23″″) to mineral gray (Rdg., XLVII, 25″″), reverse yellow ocher (Rdg., XV, 17′), substratum change to brownish red.

Growth on potato good, floccose, deep grayish olive (Rdg., XLVI, 21″″) to deep olive (Rdg., XL, 21″″), yellowish perithecia produced, substratum change to brown.

Milk unchanged in 20 days at 27°C., but litmus change to deep bluish color.

This mold resembles *Aspergillus Chevalieri* (Mangin) Thom et Church in ascospores, but is different in color of colony and of substratum which change to brown or reddish brown. The author regard this as a variety of *Aspergillus Chevalieri*, and named *Aspergillus Chevalieri* var. *ruber*.

Aspergillus repens (Corda) Saccardo.[100, 28]

(Pl. 5—8)

Colonies on Czapek's solution-agar glaucous green when young, then oil green (Rdg., V, 27), central area change to citron green (Rdg., XXXI, 25″) to sulphur yellow (Rdg., V, 25) with perithecia formation, marginal area glaucous green, reverse lemon yellow (Rdg., IV, 23) or buffy citrine (Rdg., XVI, 19′) to sayal brown (Rdg., XXIX, 15″), substratum change to pale yellowish brown; conidiophores large up to 400 μ long by 8 to 11 μ diameter, walls smooth; vesicle flask-shaped, 13 to 19 μ in diameter; sterigmata in a single series closely covering the vesicle, 8 to 11 μ long by 3 to 5 μ diameter, chains of conidia divergent; conidia oval to globose, 5 to 7.5 μ by 4.5 to 7 μ, verruculose; perithecia globoid, 65 to 120 μ in diameter; ascus contains 8 ascospores, which from 4.7 to 6 μ in long axis with shallow and smooth furrow, no frill or ridge.

Growth on Koji extract-agar slant glaucous green to dirty grayish green, central area and reverse yellowish brown, substratum change to brownish; in old cultures surface change to deep dirty grayish green, yellowish gray-brown in center, reverse and substratum change to dark yellowish gray-brown.

Koji extract-gelatin not liquefied, surface growth light yellowish

olive (Rdg., XXX, 29″) to deep grayish olive (Rdg., XVI, 19′), substratum change to brownish red.

Growth on potato poor, light brownish olive (Rdg., XXX, 19″) to buffy olive (Rdg., XXX, 21″) potato change to brown color.

Milk unchanged in 20 days at 27°C., but limus change to blue then reduced, grayish yellow-green soluble pigment produced.

Aspergillus ruber (Spieckermann et Bremer) Thom et Church.[100, 28]

(Pl. 5—9)

Colonies on Czapek's solution-agar at first glaucous green then towniy-olive (Rdg., XXIX, 17″) to orange citrine (Rdg., IV, 19) or lemon chrome (Rdg., IV, 21) at central area with production of perithecia, marginal area glaucous green (Rdg., XXXIII, 39″), reverse rau sienna (Rdg., III, 17) or brownish black, substratum change to yellowish brown to reddish brown color; conidiophores mostly arising from substratum, 250 to 300 μ long by 8 to 10 μ diameter, walls smooth; vesicle clavate to subglobose, 15 to 19 μ in diameter; sterigmata radiating in single series, 9 to 15 μ long by 3.5 to 5.5 μ diameter, conidial chains divergent; conidia elliptical to globose 6.5 to 9.5 μ long by 3.2 to 6 μ diameter, verruculose; perithecia globose, yellow, 40 to 140 μ in diameter; ascus contains 8 ascospores; ascospore thick disc-like, 6 to 6.5 μ in long axis, with shallow furrow, no frill or ridges.

Growth no Koji extract-agar abundant, at first glaucous green then dirty grayish green, central area change to reddish brown, reverse dark reddish brown, substratum change to reddish brown; old culutures powder-like, reddish brown, reverse and substratum change to brownish black.

Growth on Koji extract-gelatin abundant, deep grayish olive (Rdg., XLVI, 21‴), reverse brownish black, substratum red-brownish black and fluorescent, gelatin not liquefied in 40 days at 15°C.

Growth on potato flat and floccose, perithecia abundant, light brownish olive (Rdg., XXX, 19″), substratum change to brown.

Milk unchanged in 20 days at 27°C., but litmus change to pale blue then reduced, grayish yellow-green soluble pigment produced.

clusters of branched sterigmata or single branched sterigmata from trailing aerial hyphae, wall smooth, thick; vesicles 7.5 to 10 μ in diameter, commonly flask-shaped, fertile on the upper two-thirds with radiating sterigmata in two series, primary sterigmata 4 to 6 μ long by 2 to 2.5 μ in diameter, secondary sterigmata 6 to 7 μ long by 1.5 to 2.2 μ in diameter; conidia oval to globose 2.5 to 3.5 μ in diameter, delicately roughened, in loosely radiating chains.

Growth on Koji extract-gelatin heavy, distinct rugose, deep olive-buff (Rdg., XL, 21‴), reverse colorless, gelatin liquefied to 25 mm. deep, change to brownish red.

Growth on potato abundant, raised, floccose, conydalis green (Rdg., XLI, 29‴) to vetiver green (Rdg., XLVII, 25⁗), substratum uncolored.

Milk strongly peptonized, at first litmus change to pale blue then reduced.

Aspergillus versicolor var. *magnus* nov. var.

(Pl. 7—14)

Colonies on Czapek's solution-agar at first white, passing through shades of yellow, to vetiver green (Rdg., XLVII, 25⁗) or deep grape green (Rdg., XLI, 25‴), reverse colorless to sulphur yellow (Rdg., V, 25); conidiophores mostly arising from the substratum, larger than *Aspergillus versicolor*, up to 600 μ long by 5 to 7 μ in diameter, walls smooth, thick; vesicle flask-shaped, 11 to 14.5 μ in diameter; conidia oval to globose, 2.5 to 3.5 μ in diameter, delicately spinulose, in radiating chains.

Growth on Koji extract-gelatin good, at first deep olive-buff (Rdg., XL, 21‴), then covered with white hyphae, reverse buffy citrine (Rdg., XVI, 19′), gelatin liquefied to 25 mm. deep in 40 days at 15°C., slightly change to brown.

Growth on potato heavy, raised, floccose, andover green (Rdg., XLVII, 25⁗) to deep grayish olive (Rdg., XLVI, 21⁗) or vinaceous-buff (Rdg., XL, 17‴).

Milk strongly peptonized, litmus reduced. This molds resembles *Aspergillus versicolor* (Vuillemin) Thraboschi[10], but is different in conidiophores which almost arising from submerged hyphae and distinct large. The author regard this as a variety of *Aspergillus versicolor*, and named *Aspergillus versicolor* var. *magnus*.

803

Aspergillus flavus Link[109]

(Pl. 8—15)

Colonies on Czapek's solution-agar, spreading, buffy citrine (Rdg., XVI, 19), reverse white to olive buff (Rdg., XL, 21‴), dark brownish pigment formed in old cultures; conidiophores arising directly from substratum, or branching from aerial hyphae, 200 to 400 μ long by 6 to 8 μ in diameter, broadening upward, with walls colorless, pitted or spiny, gradually enlarging to form a vesicle 15 to 20 μ in diameter; sterigmata in one series, compactly produced at a half upper part of vesicle, 7 to 8 μ by 3.5 to 4 μ in diameter, conidial chains adherent to columnar mass; conidia subglobose or globose, smooth, 4.5 μ to 6 μ in diameter; perithecia or sclerotia not produced.

Growth on Koji extract-gelatin heavy, white, reverse deep colonial buff (Rdg., XXX, 21″), gelatin liquefied to 20 mm. deep, uncolored.

Growth on potato good, velvety or floccose, buffy citrine (Rdg., XVI, 19′) with abundant conidia, substratum uncolored.

Milk peptonized strongly, litmus change to blue.

Aspergillus flavus var. *asper* nov. var.

(Pl. 8—16)

Colonies on Czapek's solution-agar spreading, buff citrine (Rdg., XXX, 21″) to yellowish olive (Rdg., XXX, 23″), reverse Isabella color (Rdg., XXX, 19″) to ecru-olive (Rdg., XXX, 21″); conidiophore arising from substratum, 120 to 300 μ long by 6.5 to 8.5 μ in diameter, walls slightly pitted, enlarging upward to form a vesicle 13 to 18.5 μ in diameter; sterigmata in one series, compactly produced at a half upper part of vesicle, 8 to 10 μ long by 3 to 4 μ in diameter; conidial chains adherent into a columnar mass; conidia globose or subglobose, asperated, 4 to 7 μ in diameter; perithecia or sclerotia not produced.

Growth on Koji extract-gelatin heavy, olive yellow (Rdg., XXX, 23″), reverse deep colonial buff (Rdg., XXX, 21″) to buffy citrine (Rdg., XVI, 19′), gelatin liquefied to 15 mm. deep, uncolored in 40 days at 15°C.

Growth on potato good, velvetty, buffy citrine (Rdg., XVI, 19′), substratum uncolored.

Milk peptonized strongly, litmus change to blue.

This mold resembles to *Aspergillus flavus* Link,[109] but is different in conidia which asperated. The author regard this as a variety of *Aspergillus flavus*, and named *Aspergillus flavus* var. *asper*.

Aspergillus terreus Thom.[110]

(Pl. 9—17)

Colonies on Czapek's solution-agar spreading, velvety, from light ochraceous-buff (Rdg., XV, 15′) through cinnamon-buff (Rdg., XXIX, 17″) to sayal brown (Rdg., XXIX, 15″), colorless drops found, reverse lemon chrome (Rdg., IV, 21) to citron yellow (Rdg., XVI, 23′), agar lemon yellow (Rdg., IV, 23); conidiophores 70 to 100 μ long by 5.5 to 8 μ in diameter, with walls smooth, colorless, up to 1 μ thick, unseptate, with apex enlarged to form a vesicle commonly 15 to 19 μ in diameter, bearing close packed sterigmata in two series upon its domelike upper surface; primary sterigmata 6 to 7 μ long by 1.5 to 2 μ in diameter, secondary sterigmata 6.5 to 7.5 μ long by 1.5 to 1.8 μ in diameter; conidial chains adherent to solid columnar mass; conidia globose, 1.7 to 3 μ in diameter, smooth.

Growth on Koji extract-gelatin abundant, light pinkish cinnamon (Rdg., XXXIX, 15″) to sulphur yellow (Rdg., V, 25) or pinard yellow (Rdg., IV, 21), reverse deep colonial buff (Rdg., XXX, 21″) or black, gelatin liquefied to 10 mm. deep, change to brownish red.

Growth on potato abundant, flat, velvetty or floccose, cinnamon-buff (Rdg., XXIX, 17″) to tawny olive (Rdg., XXIX, 17′), substratum uncolored.

Milk peptonized strongly, litumus change to blue.

Aspergillus yezoensis nov. sp.

(Pl. 9—18)

Colonies on Czapek's solution-agar spreading, velvetty, black, reverse white to olive buff (Rdg., XL, 21‴); conidiophores commonly 400 to 600 μ long, sometimes up to 1,000 μ, by 8 to 10 μ in diameter, walls heavy, 1 to 1.5 μ in thickness, smooth hyaline; vesicles large spherical, 25 to 35 μ in diameter, covering with compact sterigmata; sterigmata in one series, 6 to 9 μ long by 3 to 5 μ in diameter; conidial chains adherent into diverging columnar masses; conidia globose, 3 to 4 μ in diameter, with spiny points.

Growth on Koji extract-gelatin distinct rugose, brownish black,

804

reverse colonial buff (Rdg., XXX, 21″), gelatin liquefied to 13 mm. deep, but uncolored.

Growth on potato velvety, vandyke brown (Rdg., XXVIII, 11″) or brownish black, substratum uncolored.

Milk peptonized strongly, litmus change to red.

This species resembles to *Aspergillus luchuensis* Inui[30] in one series sterigmata, but is different in conidial chains which adherent into diverging columnar masses, in larger conidia, and in strong peptonizing power. The author regard this as a new species, and named *Aspergillus yezoensis*.

Penicillium yezoensum Hanzawa.[27]

(Pl. 10—19)

Colonies on Czapek's solution-agar spreading, velvety or funiculose, gnaphalium green or pea green (Rdg., XLVII, 29‴), then change to light pinkish cinnamon (Rdg., XXIX, 15″) with sclerotia-production from central area, droplets abundant, reverse cream-buff or chamois (Rdg., XXX, 19″) to light mineral gray (Rdg., XLVII, 25‴), gradually tinged with pink, zonate in age; conidiophores 120 to 200 μ × 2.5 to 3 μ unbranched, dilated to 4.5 to 6 μ at the apex and bearing a verticil of 7 to 9 sterigmata 10 to 12 by 3 to 3.5 μ; conidia in chains parallel to loosely columnar in arrangement, 2.5 to 3.5 by 2 to 2.5 μ, ellipsoid, thin walled, faintly spinulose; sclerotia salmon, subglobose, 100 to 300 μ in diameter.

Growth on Koji extract-gelatin abundant, rugose, vinaceous cinnamon to light congo pink (Rdg., XXVIII, 7″) with sclerotia, reverse naples yellow to bister (Rdg., XXIX, 15″), substratum change to brownish, gelatin not liquefied.

Growth on potato poor, flat and velvety, white, substratum colored.

Milk peptonized, change to reddish brown then yellow-brown, litmus change to blue.

Penicillium spinulosum Thom.[31]

(Pl. 10—20)

Colonies on Czapek's solution-agar spreading, 700 to 800 μ in depth, floccose, andover green to slate olive (Rdg., XLVII, 25⁗–29⁗), reverse colorless to deep olive-buff (Rdg., XL, 21‴) to chamois (Rdg.,

XXX, 19″), center and margin mineral gray (Rdg., XLVII, 25‴″); drop not produced; sclerotia and perithecia are not found; zonation appeared in age. Conidiophores arising from submerged or creaping hyphae, walls smooth, 30 to 150 μ long by 2 to 3 μ in diameter with apex enlarged to 4.5 to 5μ in diameter, bearing a single verticil of sterigmata 9.5 to 10.5 by 3 to 3.5 μ; penicillus a loose column of conidial chains up to 100 to 200 μ in length by 10 to 20 μ; conidia globose, 2.7 to 3.2 μ in diameter, spinulose.

Growth on Koji extract-gelatin abundant, rugose, mineral gray (Rdg., XLVII, 25‴″) to deep grayish olive (Rdg., XLVI, 21‴″); reverse olive buff (Rdg., XL, 21‴) to naples yellow (Rdg., XVI, 19′); liquefying gelatin slowly, changing to red.

Growth on potato abundant, rugose, andover green (Rdg., XLVII, 25‴″) to Lincoln green (Rdg., XLI, 25‴), substratum uncolored.

Milk alkaline and peptonized.

Citromyces Pfefferianus Wehmer.[101]

(Pl. 11—21)

Colonies on Czapek's solution-agar spreading, flat, 1 to 1.8 mm. in depth, velvety or funiculose, mostly azonate, with margin broad, white, sage green to slate olive (Rdg., XLVII, 29‴″); reverse of colonies pale ochraceous-buff to light ochraceous-buff (Rdg., XV, 15′) at central, light mineral gray (Rdg., XLVII, 25‴″) at marginal area. Conidiophores arising from submerged or creeping hyphae, sometimes branched, rarely septate, 50 to 120 μ long by 1.2 to 2.5 μ with apex enlarged to 4 to 6 μ in diameter, walls smooth, branches 19 to 20 μ long; sterigmata 9 to 14 by 3.5 to 4.5 μ, 4 to 6 in number, compact, single; conidial chains parallel; conidia globose or subglobose, smooth, 2.2 to 4 by 2.2 to 3.3 μ; sclerotia or perithecia are not found.

Growth on Koji extract-gelatin abundant, andover green (Rdg., XLVII, 25‴″), later covered with abundant aerial hypae, colorless or pale pinkish cinnamon (Rdg., XXIX, 15″); reverse rugose, olive buff (Rdg., XL, 21‴), blakish olive at center, dark citrine (Rdg., IV, 21) at margin; gelatin liquefied to 5 mm. in depth in 40 days at 15°C.

Growth on potato abundant, raised, rugose, felted, andover green to kronbergs green (Rdg., XXXI, 25″) or olive green (Rdg., IV, 23); substratum uncolored.

Milk alkaline, but not peptonized.

805

Penicillium parallelosporum nov. sp.

(Pl. 11—22)

Colonies on Czapek's solution-agar spreading, tea green (Rdg., XLVII, 25) to storm gray (Rdg., LII, 35''''), floccose, 1.6 to 2.2 mm. in depth; reverse pinkish buff or cinnamon-buff (Rdg., XXIX, 17''), mineral gray (Rdg., XLVII, 25'''') at margin. Conidiophores 150 to 250 μ long by about 2.5 μ with apex enlarged to 6.5 to 7 μ in diameter, walls distinct spinulose, unbranched, sterigmata 10 to 15 by 3 to 3.5 μ, 7 to 9 in numbers, single; conidial chains parallel to 300 to 400 μ long; conidia elliptic, smooth, 2.5 to 3.5 by 1.5 to 2.3 μ; perithecia or sclerotia are not found.

Growth on Koji extract-gelatin abundant, distinctly rugose, mineral gray (Rdg., XLVII, 25''''); reverse Isabella color (Rdg., XXX, 19''); gelatin liquefied slowly, changing to brownish.

Growth on potato abundant, rugose felted; conidial area poor, colorless to olive buff (Rdg., XL, 21'''), substratum uncolored.

Milk slightly peptonized; litmus reduced slowly.

This species resembles *Penicillium Trzebinskii* Zaleski,[101] but different in conidiophores which markedly spinulose, in conidial chains parallel, and reverse of colonies which not changed to dark reddish brown. The author regard this as a new species of genus *Penicillium*, and named *Penicillium parallelosporum*.

Penicillium carmino-violaceum Dierckx.[101]

(Pl. 12—23)

Colonies on Czapek's solution-agar floccose or funiculose, restricted, at center raised, markedly rugose, 2.1 to 2.2 mm. in depth, artemisia green (Rdg., XLVII, 33'''') to deep grayish olive (Rdg., XLVI, 21''''), colorless droplets formed; reverse of colonies primuline yellow (Rdg., XVI, 19') or Dresden brown (Rdg., XV, 17') to buffy-pink (Rdg., XXVIII, 11'') to light russet-vinaceous (Rdg., XXXIX, 9'''); substratum changed to pale purple-brown. Conidiophores arising mostly from trailing or anastomosing hyphae, 80 to 230 μ long by 2 to 2.5 μ in diameter, walls smooth; sterigmata elongated, 14 to 18 by 2 to 3 μ, 4 to 5 in number, single; conidia elliptical, 3.5 to 4.3 by 2.4 to 3μ, smooth, in chains parallel; perithecia or sclertia not found.

Growth on Koji extract-gelatin abundant, distinctly rugose, an-

high, wrinkled, zonate, with fairly wide submerged margin, slate-olive (Rdg., XLVII, 29″″); characterized by a mixture of conidiophores rising from submerged hyphae and as branches from a loose fibrous net work of hyphae and ropes of hyphae, with colorless droplets; reverse cream-buff (Rdg., XXX, 19″); conidiophores 2.5 to 3.5 μ in diameter, and 100 to 180 μ long when arising from submerged hyphae, up to 50 to 70 μ long as branches of aerial hyphae, with walls pitted or roughened; penicilli consisting of a single verticil of sterigmata producing a loose column of conidial chains 100 to 150 μ long; sterigmata 8 to 10 μ long by 3 to 4 μ in diameter; conidia globose 2.5 to 3.5 μ in diameter, roughened; sclerotia or perithecia not formed.

Growth on Koji extract-gelatin abundant, rugose, deep grayish olive (Rdg., XLVI, 21″); reverse a central area pale lemon yellow (Rdg., IV, 23), light grayish olive (Rdg., XLVI, 21″″) to vandyke brown (Rdg., XXVIII, 11″) at margin; gelatin liquefied and change to brown.

Growth on potato abundant, raised, felted, rainette green (Rdg., XXXI, 27″), substratum uncolored.

Milk strongly alkaline, peptonized.

Penicillium columnare Thom.[10]

(Pl. 14—28)

Colonies on Czapek's solution-agar poor, velvety in appearance, with scattered trailing hyphae bearing some conidiophores at center and very thinly growing, andover green (Rdg., XLVII, 25″″); reverse and substratum colorless in young pale reddish brown in age; sclerotia or perithecia not found; no drops seen; penicillus a solid column about 15 to 20 μ in diameter and up to 200 μ long; conidiophores 30 to 90 μ long by 2.5 to 3 μ arising from submerged or trailing hyphae; apex vesiclelike up to 4 to 6.5 μ in diameter, with a single verticil of sterigmata; sterigmata 5 to 9 μ by 2.5 to 3 μ with chains long and adherent into a column; conidia 2.5 μ, spinulose; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, rugose, andover green (Rdg., XLVII, 25″″); reverse olive buff (Rdg., XL, 21‴) to pale lemon yellow (Rdg., IV, 23); gelatin liquefied and colored to pale brown.

Growth on potato abundant, raised somewhat, velvety or floccose, rainette green (Rdg., XXXI, 27″) to Kronberg's green (Rdg., XXXI,

806

25″).

Milk slightly basic, peptonized.

Penicillium ellipticum nov. sp.

(Pl. 15—29)

Colonies on Czapek's solution-agar restricted, center raised to 1.5 to 3 mm. high, rugose, funiculose, margin white about 1 mm. in width, conidial area tea green (Rdg., XLVII, 25‴), azonate; large colorless drops seen abundantly; reverse of colonies olive-buff (Rdg., XL, 21‴) to olive-gray or dark olive-gray (Rdg., LI, 23⁗); substrate uncolored. Conidiophores mostly arising from trailing or anastomosing hyphae, simple or sparingly branched with sterigmata monoverticillate, walls smooth, 2 to 2.5 μ in diameter, and to 200 μ long when arising from submerged hyphae, up to 10 to 40 μ long as branches of aerial hyphae; sterigmata 10 to 16 × 2.5 to 4 μ, 2 to 3 in number; conidia elliptical, faintly spinulose, 3 to 4.5 × 1.7 to 2.8 μ; conidial chains parallel or divergent, sclerotia or perithecia not produced.

Growth on Koji extract-gelatin abundant, rugose, mineral gray (Rdg., XLVII, 25⁗) to deep grayish olive (Rdg., XLVI, 21⁗); reverse dull citrine (Rdg., XVI, 21′) to Kronberg's green (Rdg., XXXI, 25″); gelatin liquefied, uncolored.

Growth on potato abundant, rugose, felted, white with aerial hyphae.

Milk alkaline but not peptonized.

The known species in Penicillium Monoverticillata-Ramigena section, having the elliptical conidia, are *Penicillium cyaneum* (Bainier et Sartory) Biourge[101] and *Citromyces musae* Bainier et Sartory. The species is different from this species in the color of colonies, and the latter different in the shape of conidia; the author named this species *Penicillium ellipticum*.

Penicillium Waksmani Zaleski.[101]

(Pl. 15—30)

Colonies on Czapek's solution-agar spreading, radiately wrinkled, occasionally showing zonation, with central area somewhat elevated 1.5 mm. high, marginal area velvety, central area funiculose, abundant colorless large drops seen, conidial area sage green (Rdg.,

XLVII, 29″″) to deep olive-gray (Rdg., LI, 29″″), margin white 2 mm. in width; reverse primrose yellow or olive-ocher (Rdg., XXX, 23″–21″), marginal area tea green or pea green (Rdg., XLVII, 25″″–29″″). Conidiophores arising from trailing or anastomosing hyphae, very short 10 to 70 μ long by 2 to 3 μ in diam.; penicilli partly single verticils of sterigmata, partly showing one or more branches with secondary penicilli; sterigmata 8 to 10 μ by 2.5 to 3.5 μ, 2 to 5 in number; conidia globose, 2.5 to 3 μ in diameter, with walls faintly pitted; conidial chains forming a short column; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, mineral gray (Rdg., XLVII, 25″″), covered with white aerial hyphae; reverse Naples yellow or buffy citrine (Rdg., XVI, 19′), rugose; gelatin slowly liquefied and change slightly reddish.

Growth on potato poor, raised, at first colorless, then deep slate-olive (Rdg., XLVI, 29″″) to Lincoln green (Rdg., XLI, 25″″).

Milk alkaline and peptonized; litmus reduced; yellowish green soluble pigment produced.

Penicillium Sartoryi Thom.[101]

(Pl. 16—31)

Colonies on Czapek's solution-agar spreading, convex, 1.5 to 2 mm. high, sometimes slightly zonate, margin velvety, central area floccose, andover green to slate-olive (Rdg., XLVII, 25″″–29″″); reverse lily green or deep slate-green (Rdg., XLVII, 33″″), at center light drab (Rdg., XLVI, 17″″). Conidiophores mostly arising from submerged hyphae, sometimes long trailing hyphae, 80 to 250 μ long by 1.7 to 2.8 μ in diameter, variously branching with the secondary branches often longer than the main axis, each terminating in a monoverticillate penicillus, walls smooth; sterigmata 8 to 11 μ long by 2.5 to 3 μ, 4 to 6 in number, conidia elliptic when young, oval or globose when ripened, smooth, 2.5 to 3.7 by 2 to 3.5 μ; conidial chains parallel or forming a loose column; perithecia or sclerotia not found.

Growth on Koji extract-gelatin abundant, rugose, deep grayish olive (Rdg., XLVI, 21″″) to blackish olive; reverse Isabella color (Rdg., XXX, 19″) at center, blackish olive or black in margin; gelatin slowly softened, changed reddish.

Growth on potato poor, somewhat raised, white.

807

Milk alkaline, but not peptonized.

Penicillium spinulo-ramigenum nov. sp.

(Pl. 16—32)

Colonies on Czapek's solution-agar spreading, raised at center to 2.1 to 2.2 mm. high, margin broadly submerged, velvety at marginal area, funiculose at central area, azonate, slate-olive (Rdg., XLVII, 29″″), later covered with white aerial hyphae; reverse center cream buff or honey yellow (Rdg., XXX, 19″), margin olive-gray (Rdg., LI, 23″″). Conidiophores arising from submerged hyphae or branches of aerial or ropy hyphae, simple or branching with the secondary branches, each terminating in a monoverticillate penicillus, walls distinctly spinulose, 90 to 350 μ long by 2.5 to 4.5 μ in diameter, at apex enlarged to 5 to 6 μ in diameter; sterigmata 10 to 12 by 3 to 4 μ, 8 to 9 in number; conidia globose or subglobose, 2.2 to 3.5 μ in diameter, faintly roughened; conidial chains parallel; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, andover green (Rdg., XLVII, 25″″), covered with white aerial hyphae; reverse light brownish olive (Rdg., XXX, 19″) to vandyke brown (Rdg., XXVIII, 11″) at center, Victoria lake (Rdg., I, 1) to black at margin; gelatin liquefied and colored to brownish red.

Growth on potato abundant, raised and rugose, felted, Kronberg's green (Rdg., XXXI, 25″).

Milk alkaline and peptonized at first, then changed to neutral; litmus reduced in 20 days.

There is no species, which seen the pitted or spinulose walls on conidiophore and conidia, in the Penicillium Monoverticillata-Ramigena series.[101] The author recommended this as a new species, and named *Penicillium spinulo-ramigenum*.

Penicillium digitatum Saccardo.[101]

(Pl. 17—33)

Colonies on Czapek's solution-agar very poor, thin, spreading, 1.8 to 1.9 mm. high at center, velvety to funiculose, white powderly then change to pale yellowish olive-green; reverse colorless or pale grayish brown. Conidiophores arising from submerged hyphae or as branches of trailing or anastomosing hyphae, 30 to 100 μ long by

diameter, smooth; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, mineral gray (Rdg., XLVII, 25″″); reverse olive ocher (Rdg., XXX, 21″) to burnt sienna (Rdg., II, 9); gelatin slowly or partly liquefied, uncolored.

Growth on potato abundant, raised, wrinkled, felted, Lincoln green (Rdg., XLI, 25″).

Milk peptonized strongly; litmus change to blue partly, then to red, reduced in age.

Penicillium crustosum Thom.[101]

(Pl. 21—40)

Colonies on Czapek's solution-agar spreading, velvety or fasciculate, indistinctly zonate in age, about 100 to 250 μ deep in velvety appearing areas with the development of continuous crusts of conidial chains, which break off as irregular masses when struck or tapped; drops colorless; odor slightly fruity; conidial area pistachio green (Rdg., XLI, 33″″) to sage green (Rdg., XLVII, 33″″); margin white; reverse light mineral gray (Rdg., XLVII, 25″″) to colonial buff (Rdg., XXX, 21″); substratum uncolored. Conidiophores 80 to 100 μ long by 3 to 4 μ in diameter, with walls rough pitted; penicillus consisting usually of the main axis and one branch variously up to 30 μ long appressed with few metulae 10 to 18 μ long and groups of sterigmata 8 to 13 μ long by 2.5 to 3.5 μ, branches and metulae pitted; conidia globose 2.5 to 3.7 μ in diameter, smooth; conidial chains parallel; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, andover green (Rdg., XLVII, 25″″); reverse radiately wrinkled, olive ocher (Rdg., XXX, 21″); gelatin liquefied and changed to slightly yellowish brown.

Growth on potato abundant, raised, felted, andover green (Rdg., XLVII, 25″″) to Rainette green (Rdg., XXXI, 27″).

Milk strongly peptonized; litmus reduced or slightly acid.

Penicillium crustosum var. *spiculosporum* nov. var.

(Pl. 21—41)

Colonies on Czapek's solution-agar spreading, fasciculate or velvety, zonate broadly, with the development of continuous crusts of conidial chains, which break off as irregular masses when struck or tapped; drops colorless; odor slightly fruity; conidial area elm

808

green or varley's green (Rdg., XVII, 27′–XVIII, 31′) when young, olive-brown (Rdg., XL, 17‴) in old cultures; reverse colorless or cream color to naples yellow (Rdg., XVI, 19′), margin gnaphalium green (Rdg., XLVII, 29⁗); substratum uncolored. Conidiophores 60 to 300 μ long by 4 to 5 μ in diameter, with walls rough pitted, single or coremiform; penicillus consisting usually of the main axis and one branch variously up to 40 μ long appressed with few metulae 10 to 18 μ long and groups of sterigmata 10 to 11 by 3 to 4 μ; conidia globose 3 to 4.5 μ in diameter, markedly spinulose; conidial chains parallel; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, andover green (Rdg., XLVII, 25⁗); reverse radiately wrinkled, light grayish olive (Rdg., XLVI, 21⁗), margin olive ocher (Rdg., XXX, 21″); gelatin liquefied partly, becoming slightly brownish.

Growth on potato abundant, velvety, Lincoln green (Rdg., XLI, 25‴).

Milk strongly peptonized; litmus changed to blue at first, then neutral, through faint red, reduced at last.

This strain resembles *Penicillium crustosum* Thom[101], but different in the surface of conidia which markedly spinulose. The author regard this as a new variety of *Penicillium crustosum*, and named var. *spinulosporum*.

Penicillium expansum Thom.[101]

(Pl. 22–42)

Colonies on Czapek's solution-agar spreading, zonate, fasciculate; drops colorless; pistachio green or American green (Rdg., XLI, 33‴), sometimes covering with conidial crusts, margin white; reverse colorless or rarely yellowish in margin; substratum uncolored. Conidiophores 150 to 270 μ long by 2.7 to 3 μ in diameter, single or coremiform, with walls smooth; penicillus to 50 μ long, consisting of the main axis and one branch with few metulae and sterigmata; branches 15 to 35 μ long; metulae 9 to 16 μ by 2 to 3.5 μ, in groups of 2 to 4; sterigmata 10 to 15 by 2.8 to 3 μ in groups of 2 to 5; conidia elliptical or oval, 3 to 4 by 2.5 to 3.2 μ, smooth; conidial chains parallel; sclerotia or perithecia not found.

Growth on Koji extract-gelatin abundant, rugose, andover green (Rdg., XLVII, 25⁗); reverse olive ocher (Rdg., XXX, 21″); gelatin liquefied and changed slightly brownish.

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809

EXPLANATION OF THE PLATES

PLATE 1

Rhizopus nigricans Ehrenberg 1
Oospora lactis (Fresenius) Saccardo 2

Sp : sporangiospore
Sph : sporangiophore
Cl : columella

PLATE 2

Oospora suaveolens (Lindner) Lindau 3

PLATE 3

Oospora lupuli (Matthews et Lott) Saccardo 5
Aspergillus clavatus Desmazieres 4

Cdp : conidiophore with conidial chains.
V : vesicle with sterigmata.
St : sterigmata.
Cd : conidia.

PLATE 4

Aspergillus Chevalieri (Mangin) Thom et Church 6
Aspergillus Chevalieri var. *ruber* nov. var. 7

Cdp : conidiophore with conidial chains.
V : vesicle with sterigmata.
St : sterigmata.
Cd : conidia.
As : ascus.
Ap : ascospore.

PLATE 5

Aspergillus repens (Corda) Saccardo 8
Aspergillus ruber (Spiekerman et Bremer) Thom et Church 9

Cdp : conidiophore with conidial chains.
V : versicle with sterigmata.
St : sterigmata.
Cd : conidia.
Ap : ascospore.

PLATE 6

Aspergillus fumigatus Fresenius 10

Aspergillus nidulans (Eidam) Winter 11
Aspergillus Sydowi (Bainier et Sartory) Thom et Church 12

Cdp : conidiophore with conidial chains.
V : vesicle with sterigmata.
V_1 : reduced conidial apparatus.
St : sterigmata.
Cd : conidia.

PLATE 7

Aspergillus versicolor (Vuillemin) Tiraboschi 13
Aspergillus versicolor var. *magnus* nov. var. 14

Cdp : conidiophore with conidial chains.
V : vesicle with sterigmata.
V_1 : reduced conidial apparatus.
St : sterigmata.
Cd : conidia.

PLATE 8

Aspergillus flavus Link 15
Aspergillus flavus var. *asper* nov. var. 16

Cdp : conidiophore with conidial chains.
V : vesicle with sterigmata.
St : sterigmata.
Cd : conidia.

PLATE 9

Aspergillus terreus Thom 17
Aspergillus yezoensis nov. sp. 18

Cdp : conidiophore with conidial chains.
V : versicle with sterigmata.
St : sterigmata.
Cd : conidia.

PLATE 10

Penicillium yezoensum Hanzawa 19
Penicillium spinulosum Thom 20

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 11

Citromyces Pfefferianus Wehmer 21

810

Penicillium parallelo-sporum nov. sp. 22

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 12

Penicillium carmino-violaceum Dierckx 23
Penicillium fellutanum Biourge 24

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 13

Penicillium citreo-viride Biourge 25
Penicillium Paczoskii Zaleski 26

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 14

Penicillium Terlikowskii Zaleski 27
Penicillium columnare Thom 28

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 15

Penicillium ellipticum nov. sp. 29
Penicillium Waksmani Zaleski 30

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 16

Penicillium Sartoryi Thom 31
Penicillium spinulo-ramigenum nov. sp. 32

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 17

Penicillium digitatum Saccardo 33

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 18

Penicillium citreo-roseum Dierckx 34
Penicillium Roqueforti Thom 35

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 19

Penicillium Janczewskii Zaleski 36
Penicillium solitum Westling 37

Cdp : conidiophore with conidial chains
Pn : penicillus.
Cd : conidia.

PLATE 20

Penicillium flavo-glaucum Biourge 38
Penicillium palitans Westling 39

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 21

Penicillium crustosum Thom 40
Penicillium crustosum var. *spinulo-sporum* nov. var. 41

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 22

Penicillium expansum Thom 42
Scopulariopsis brevicaulis (Saccardo) Bainier 43

Cdp : conidiophore with conidial chains.
Pn : penicillus.
Cd : conidia.

PLATE 23

Paecilomyces varioti Bainier 44

811

Cdp : conidiophore with conidial chains.
Cd : conidia.

PLATE 24

Trichoderma Koningi Oudemans 45
Botrytis cinerea Persoon 46
Trichothecium roseum Link 47

Cdp : conidiophore with conidial heads.
Cd : conidia.

PLATE 25

Dematium pullulans De Bary 48

Cdp : fertile hyphae with conidia.
Rc : resting cells.

PLATE 26

Cladosporium herbarum (Persoon) Link 49
Stemphylium botryosum Walle. var. *botrytis* (Preuss) Lindau 50
Alternaria tennuis Nees 51

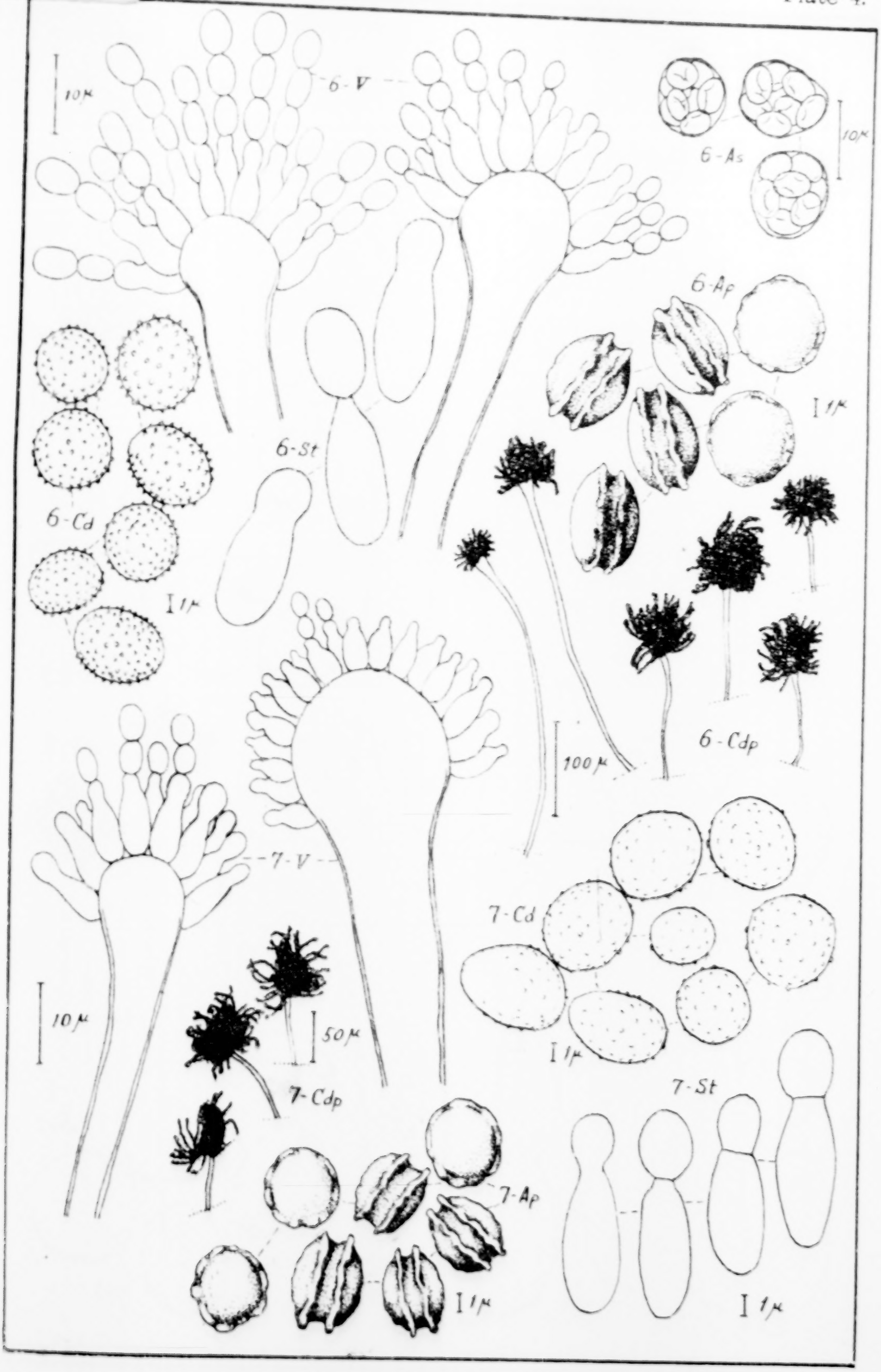
Cdp : conidiophore with conidial chains.
Cd : conidia.

PLATE 27

Fusarium sp. 52
Epicoccum purpurascens Ehrenberg 52

Cdp : conidiophore.
Cd : conidia.

812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1μ
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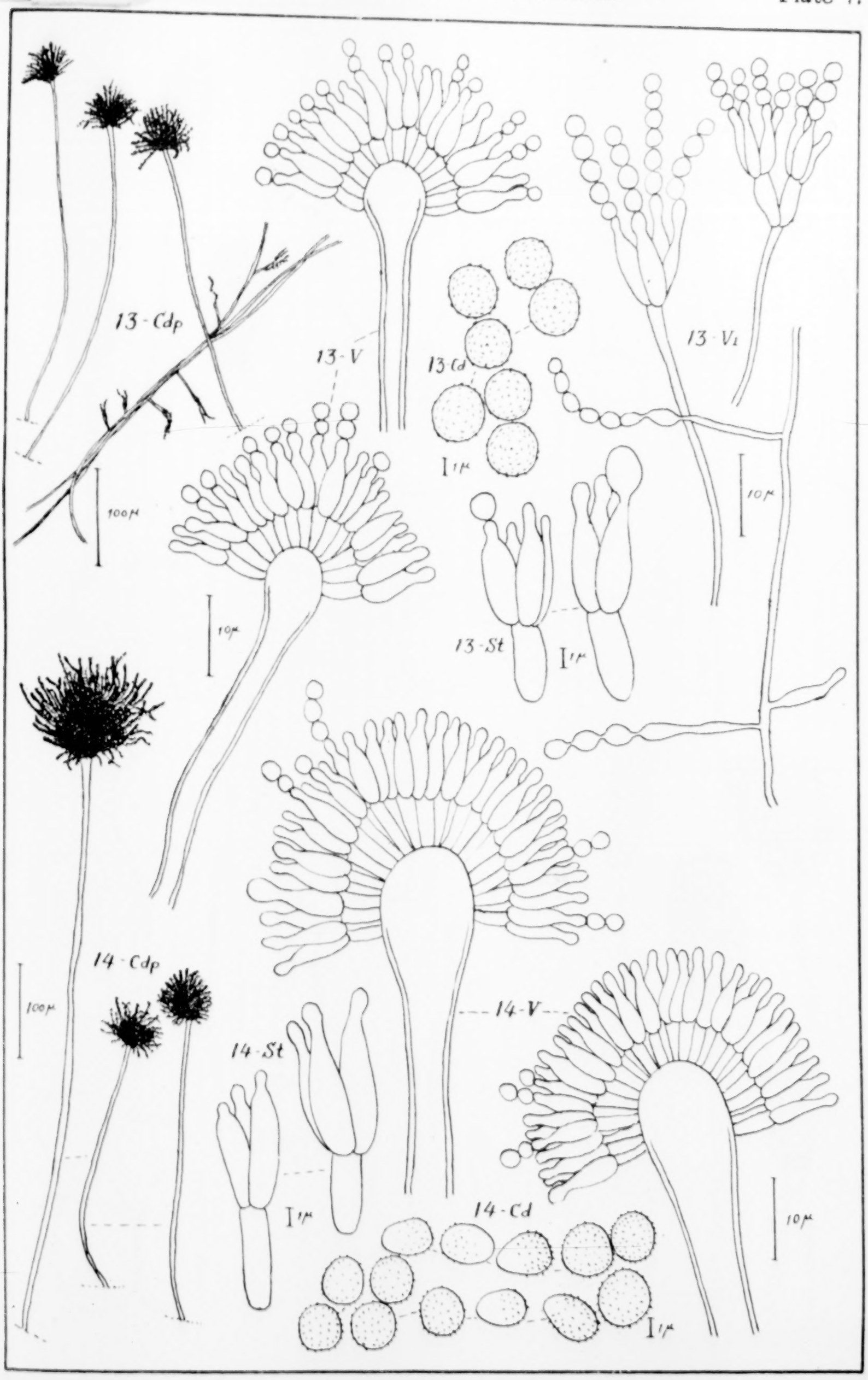
813



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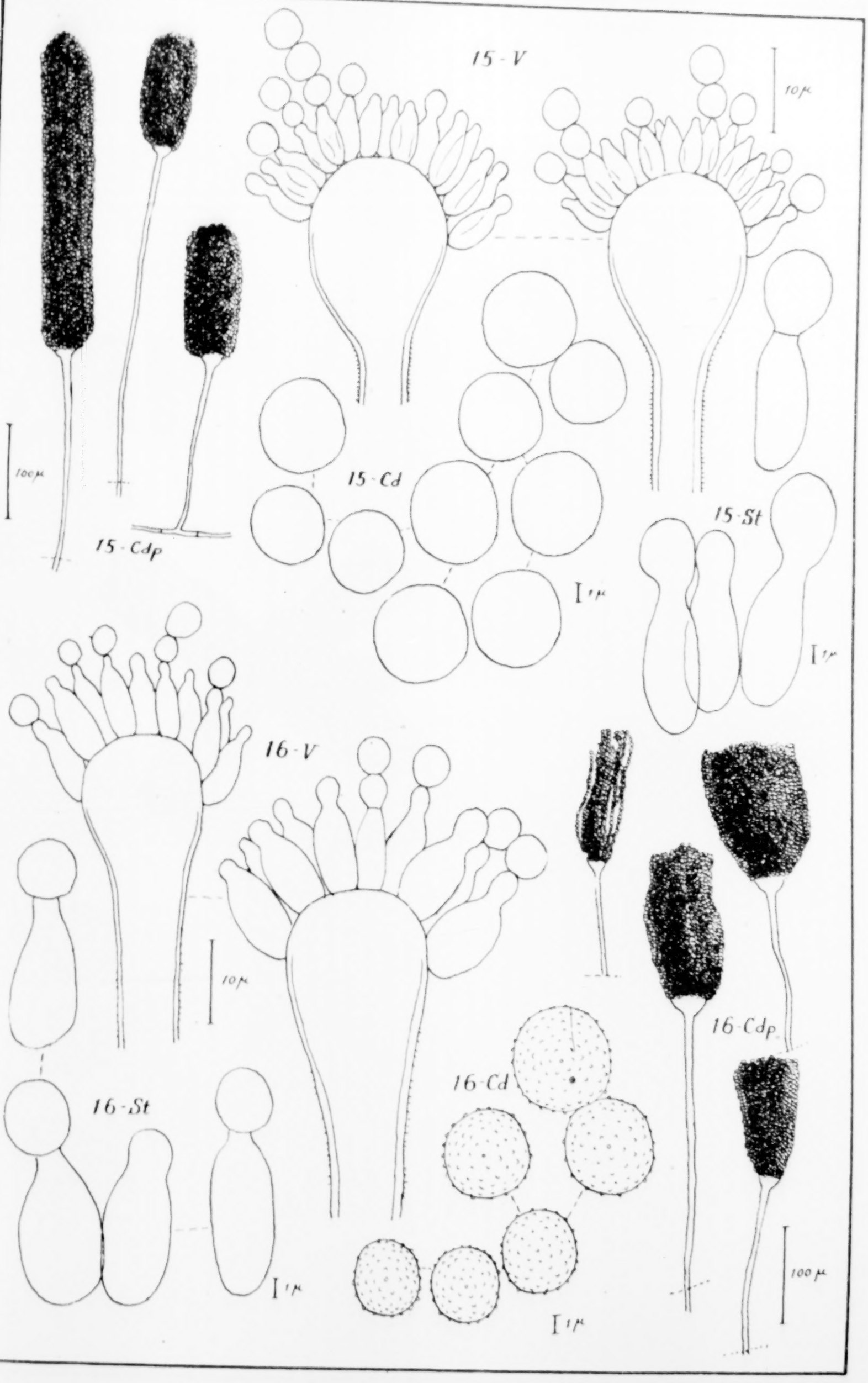
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16-St
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16-Cd
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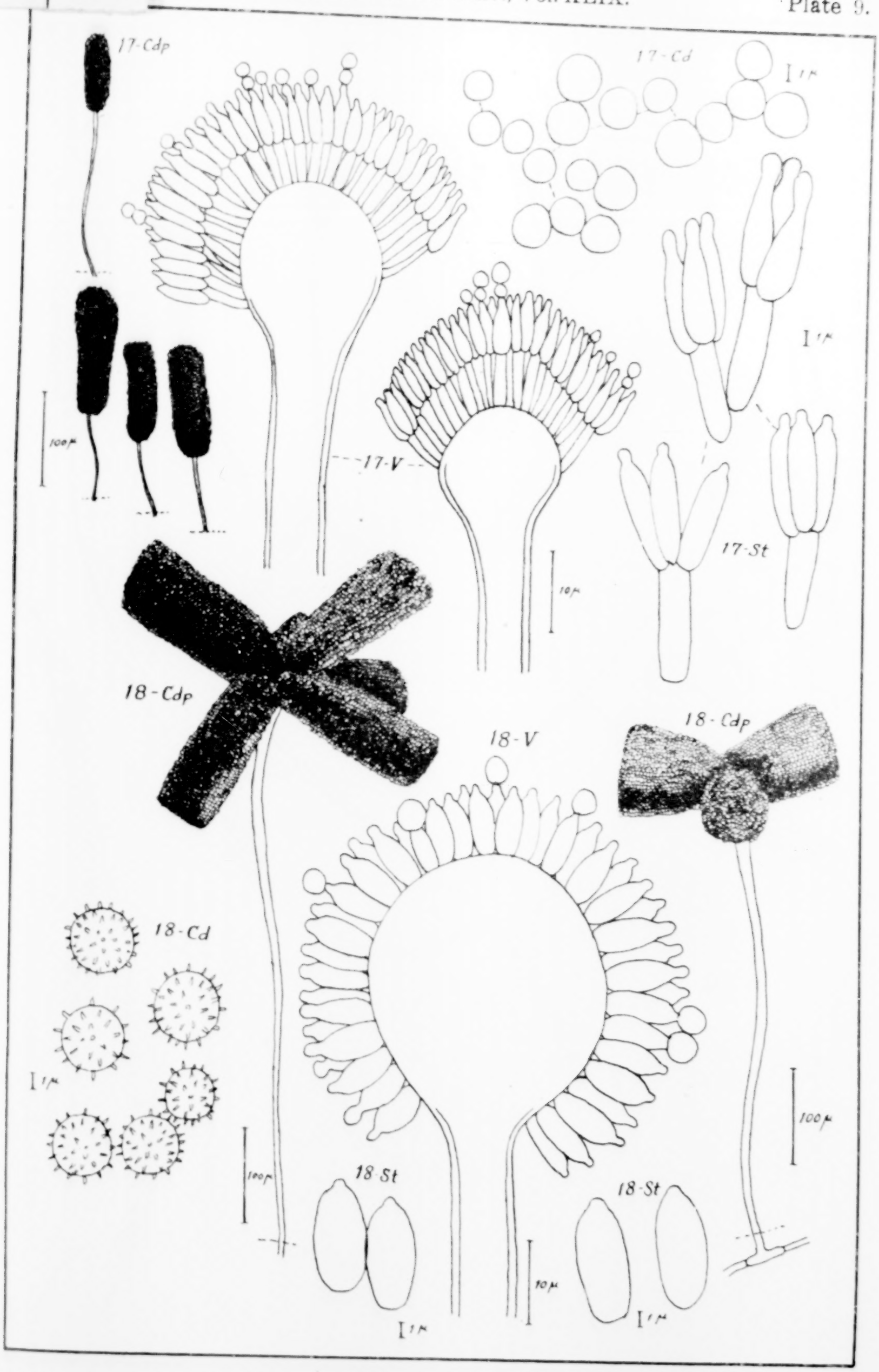
16-Cdp
100μ

815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10μ
18-Cdp
18-V
18-Cdp
18-Cd
1μ
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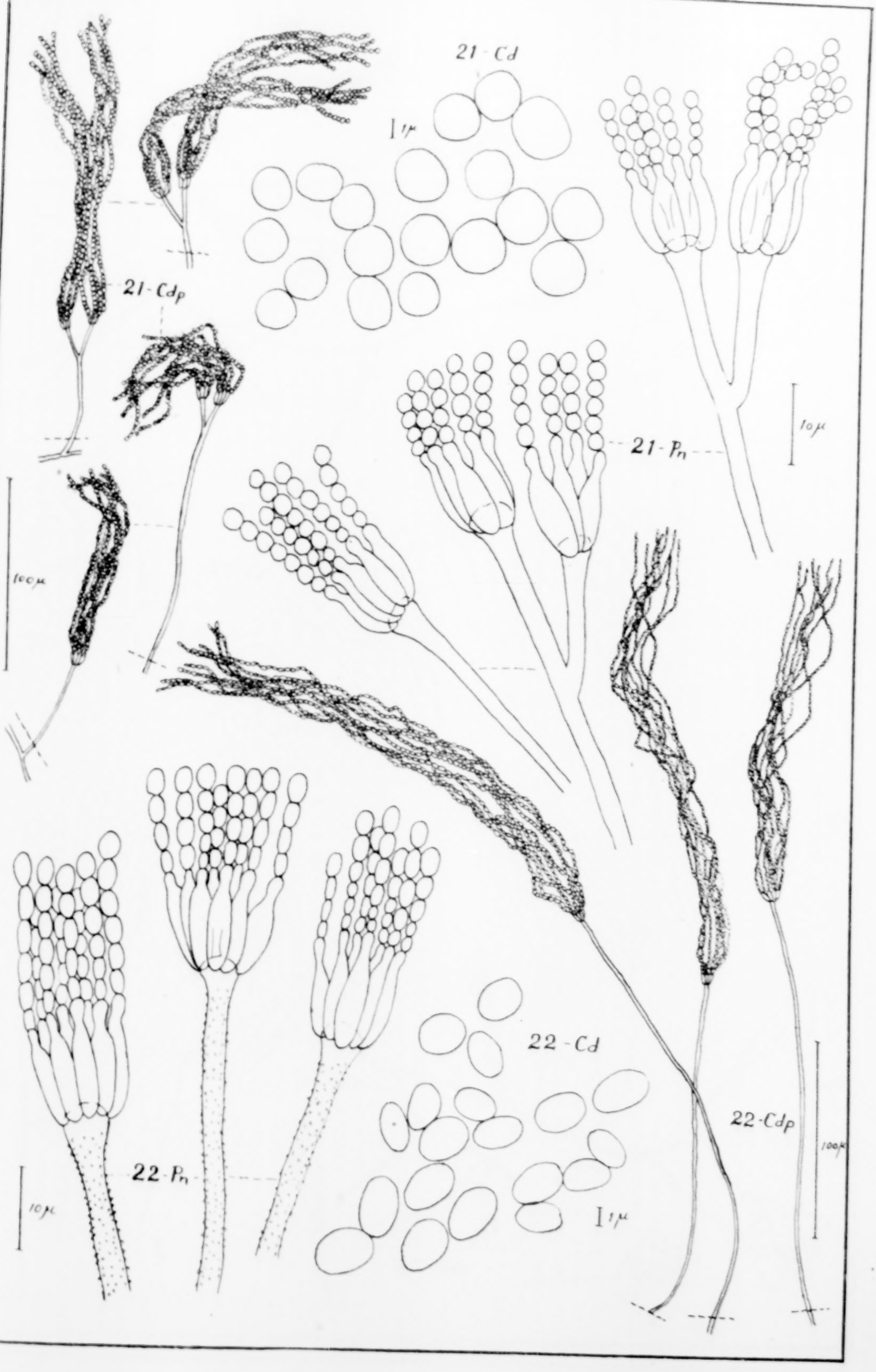
100μ
18-St
18-St
10μ
1μ
1μ

INDEX OF FUNGI Vol. 2 Diagnoses

816



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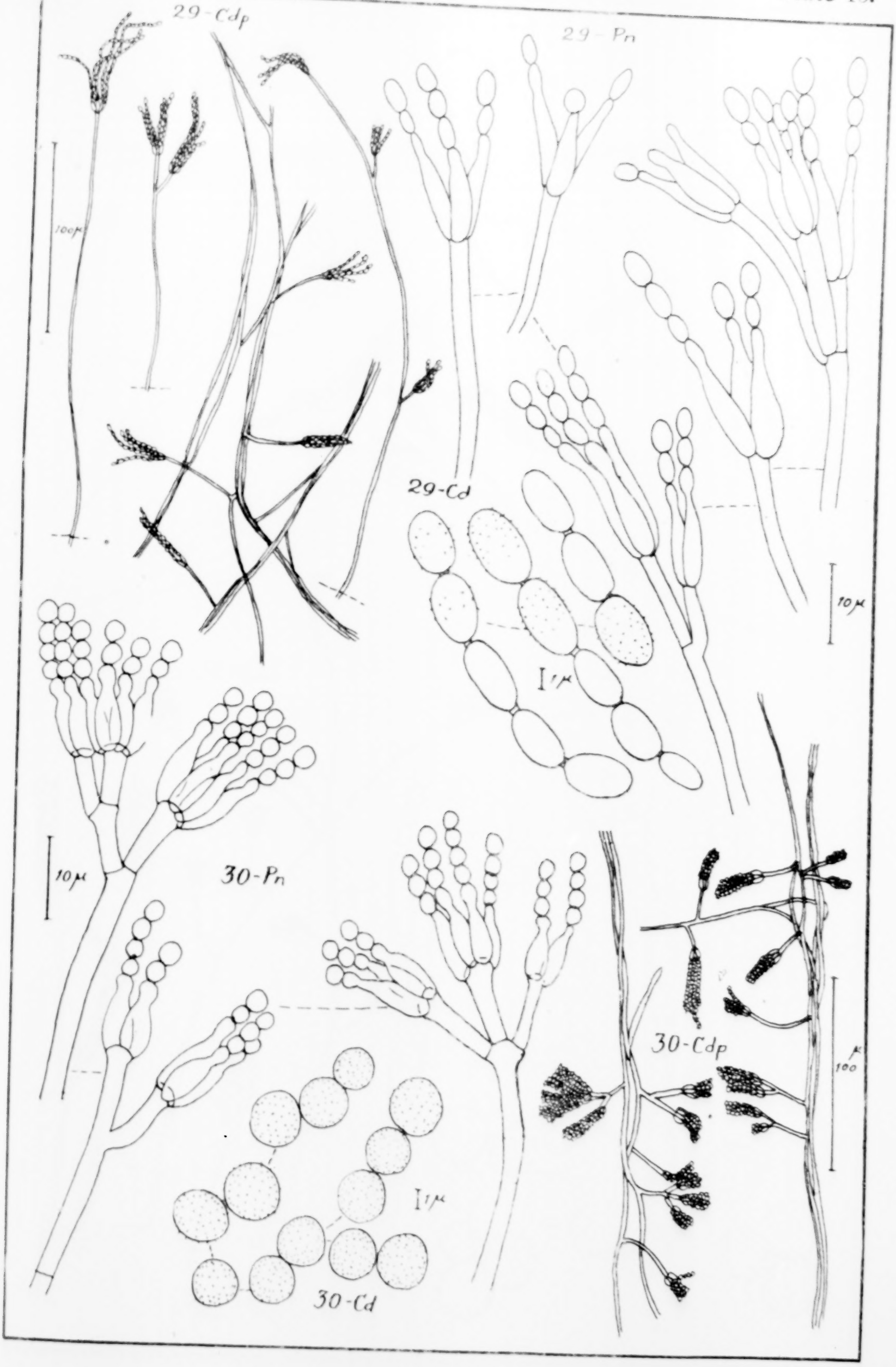

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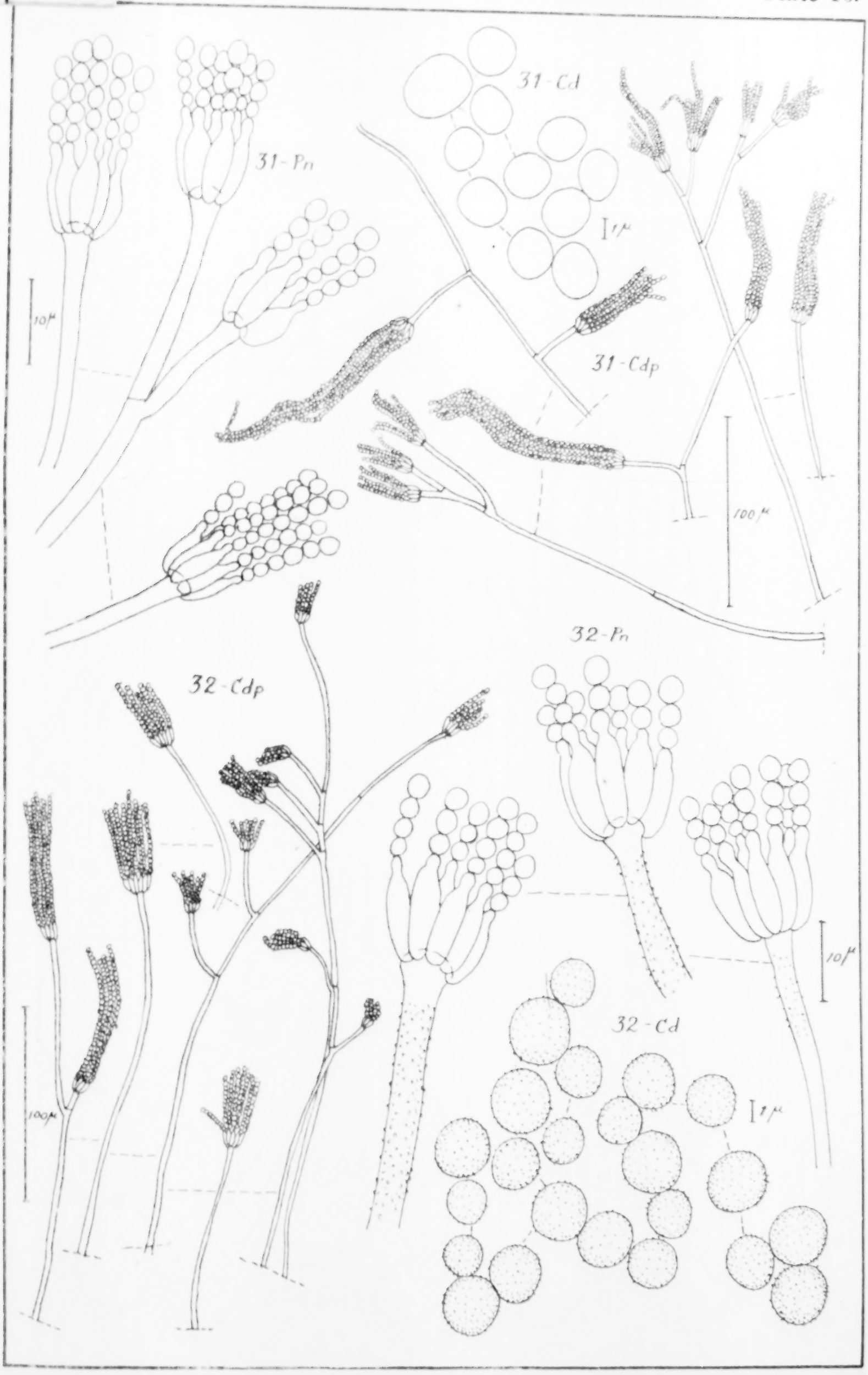

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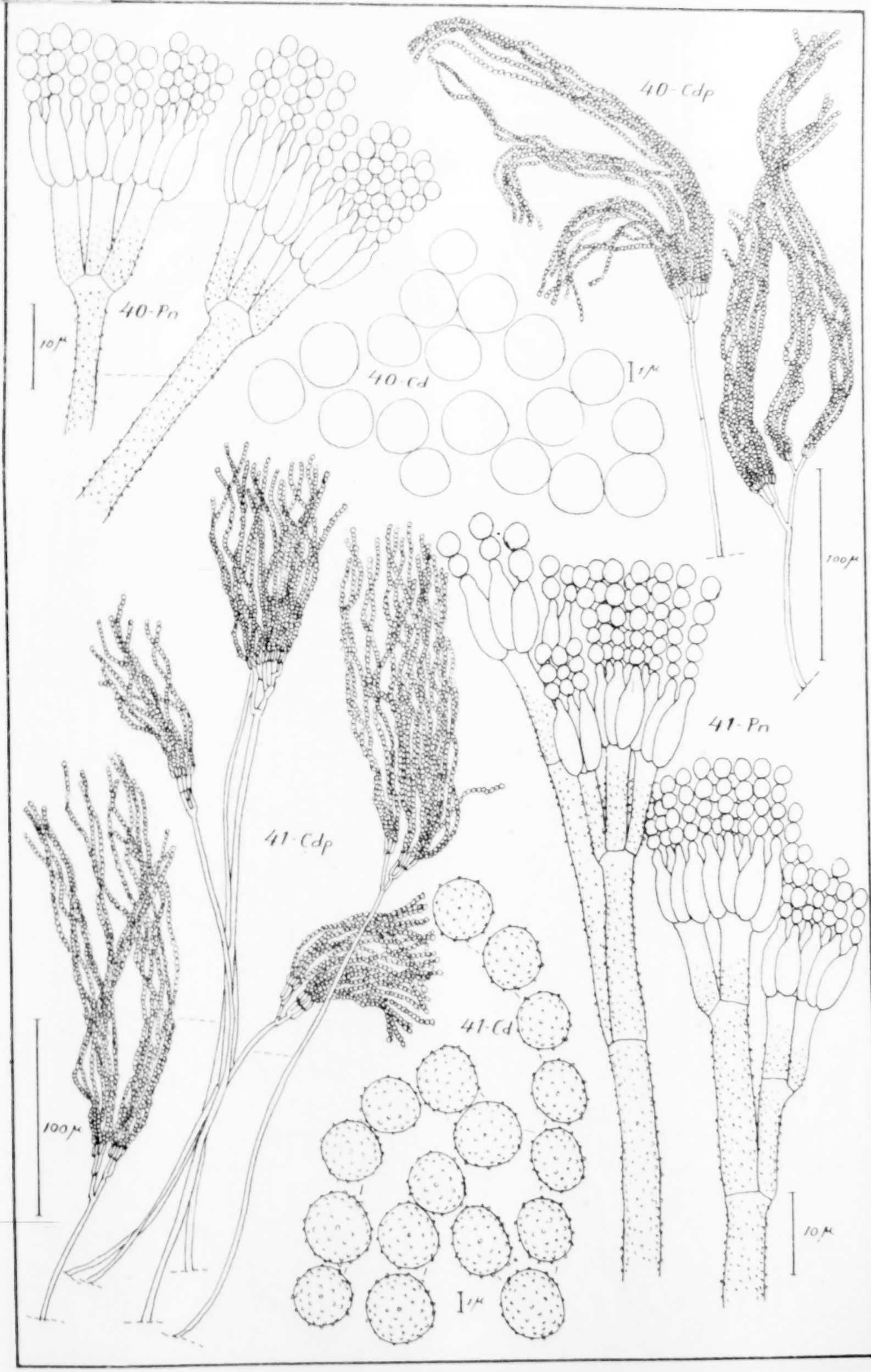

thyllis tetraphylla dans le domaine circumméditerranéen, ne peut être rapporté à *U. anthyllidis*. Trois raisons justifient l'isolement spécifique de cette Urédinée. Tout d'abord elle est précoce en saison, les probasides accompagnant la formation des premiers urédosores qui se constituent le plus souvent en pustules mixtes, largement déhicentes et corrodantes, bientôt confluentes en amas pulvérulents, d'un roux violacé foncé dès que les probasides sont présentes. D'autre part les mensurations des spores (urédospores et probasides) tant sur les spécimens en provenance d'Espagne (*leg.* UNAMUNO) que sur ceux originaires d'Afrique du Nord montrent pour l'un ou l'autre des stades évolutifs des dimensions plus élevées (tant en extrêmes qu'en moyenne) que pour *Uromyces anthylidis sens.strict.* prélevé sur *Anthyllis vulneraria* [1939, VIENNOT-BOURGIN (G.), Contribution à l'étude de la Flore cryptogamique du bassin de la Seine (14e note), *Rev. de Pathol. vég. et d'Entom. agric. de France*]. Enfin en recherchant la concordance phanérogame×cryptogame, dont nous venons de donner plusieurs exemples, il nous paraît nécessaire de séparer les deux Urédinées l'une : *U. anthyllidis* sur *Anthyllis*, étant hébergée par un représentant de la tribu des Ononinées ROUY caractérisées par des étamines monadelphes, l'autre *Uromyces physanthyllidis sp. nov.* sur *Physanthyllis* parasitant une Glycyrrhizée à étamines diadelphes.

Nous proposons de décrire cette nouvelle espèce avec la diagnose suivante :

Uromyces physanthyllidis sp. nov. = *U. anthyllidis* (GREV.) SCHROET. *p.p. Uredosoris amphigenis, hypo-vel epiphyllis, rotundatis, sparcis, pulverulentis, cinnamomeo-brunneis; uredosporis globosis, ochraceo-cinnamomeis,* 21-29×18-26 μ (25×23,1), *tunica usque* 2-2,5 μ, *spinola, poris germinativis* 4-5; *teleutosoris uredosoris immixtis, atro-brunneis, latis; teleutosporis globosis v. ellipsoideis,* 20-29×18,22 μ (24,7×20,2 *med.*), *tunica æqualiter crassa, punctato-verrucosa, poro germinativo apicali, papillati, pedicello hyalino, brevissimo.*
HAB. *in foliis Physanthyllidis tetraphyllae.*

4° Cette nouvelle étape dans la fragmentation de *U. anthyllidis*, reconnu dès 1904 par JORDI comme constituant plutôt un cadre morphologique d'une suite de formes adaptées biologiquement à quelques plantes-hôtes, doit trouver sa justification dans son étude critique sur des supports n'appartenant pas aux Ononinées-Anthyllinées. Parmi ceux-ci et grâce au docteur Eug. MAYOR (Neuchâtel) qui a bien voulu nous confier l'ensemble des matériaux provenant de ses propres récoltes, il nous a été donné de procéder

820

à l'examen des urédospores et des probasides sur *Coronilla varia* L. (1). Rappelons que la présence d'un *Uromyces* sur *Coronilla varia* est précisée dans Ed. FISCHER (1904) par les récoltes de MAYOR (17 oct. 1901 et 18 août 1903) qu'il nous a été à même d'étudier et par celles de D. CRUCHET le 4 octobre 1901; ces différents échantillons proviennent tous des bords du lac de Neuchâtel. CONSTANTINEANU (1920, Urédinées de Roumanie, *Ann. Univ. Jassy*) signale cette Urédinée que G. MOESZ (1941, *Fungi Hungariae;* IV Basidiomycètes - *Pars. I, Uredineae, Ann. Musei nation. Hungarici,* 34) indique sur *Coronilla emerus* L. (*Uromyces apiculatus*

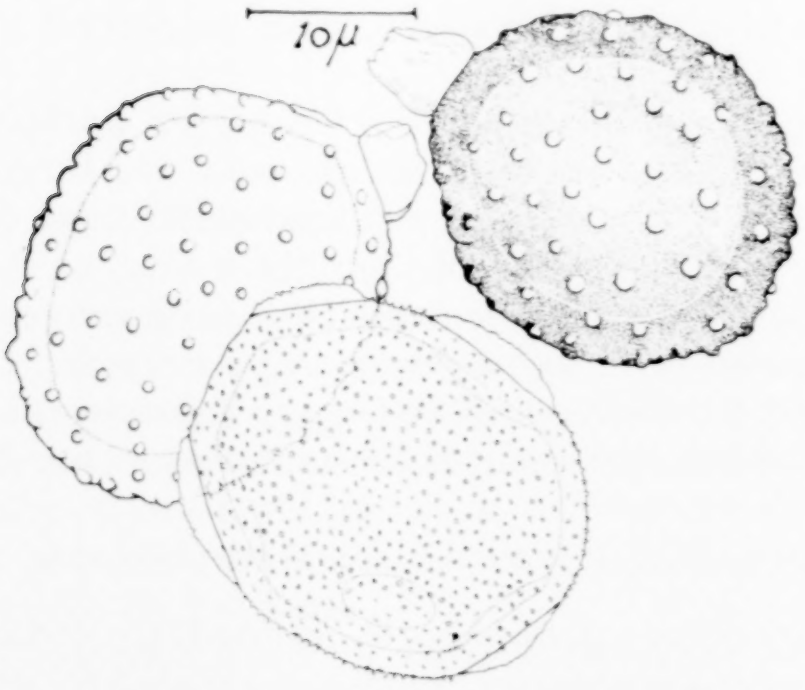

FIG. 1
Urédospore et probasides de *Uromyces coronillae* sp. nov.
sur *Coronilla varia.*

LÉV. f. *coronillae* HZS.) et sur *Coronilla varia* (*Uredo leguminosarum* f. *coronillae*) d'après des spécimens récoltés par DIETZ et HAZSLINSKY aux environs de Budapest. Il s'agit donc, à l'heure actuelle, d'une Urédinée de localisation géographique restreinte. Sur la plus grande partie des exemplaires, seules existent des urédospores dans des pustules arrondies, peu proéminentes, très petites, isolées, rarement confluentes en petits amas. Les uré-

(1) Les spécimens étudiés ont pour origine :
Stade II. — Bord du lac de Neuchâtel entre la Brinaz et le Bay.-Yverdon (Vaud), 17/10/1901; *leg.* Eug. MAYOR.
Stades II et III. — Champs entre la Brinaz et le Bay, Tuilerie de Grandson (Vaud), 18/8/1903; *leg.* Eug. MAYOR.
Stades II et III. — Chemin de Castagnola à Gandria, près Lugano (Tessin), 3/8/1908; *leg.* Eug. MAYOR.

dospores mesurent 24-26,5×20-24 μ. Leur membrane, épaisse de 2 à 2,5 μ, pourvue d'aiguillons serrés, hyalins, est percée de cinq à six pores germinatifs larges de 6 à 8 μ, revêtus d'une papille crénelée, proéminente et convexe. Les probasides s'observent en mélange avec les urédospores, toujours en petit nombre. Nous n'avons pas constaté l'existence de probasidiosores individualisés. Les probasides, d'un fauve clair, jamais roux ou d'un brun-roux obscur, ovoïdes, régulières ou asymétriques, à membrane épaisse latéralement de 2,2 μ, au sommet de 2,5 μ, mesurent 19-23×18-21 μ (moyennes : 21,4×19,8). La membrane des probasides est couverte de verrues bien distinctes, arrondies, qui en couvrent toute la surface et à la marge de laquelle elles se profilent régulièrement. Le pore germinatif n'est pas distinct et on ne perçoit pas de papille apicale.

Cet *Uromyces* se distingue de *Uromyces anthyllidis* par les pores germinatifs des urédospores qui sont très larges, par la verrucosité régulière des probasides qui présentent une coloration peu intense et ne comportent pas de papille.

L'*Uromyces* sur *Coronilla varia* s'éloigne également des espèces décrites sur les autres Coronillées (*U. hippocrepidis*, *U. Gæumanni*, *U. bonaveriae*, *U. ornithopodioidis*) par l'absence de sores à probasides distincts et fortement colorés ainsi que par les caractères des spores.

Nous décrirons l'espèce avec la diagnose suivante :

Uromyces coronillae sp.nov. = *U. anthyllidis* (Grev.) Schroet. *p.p. Uredosoris amphigenis, hypo-vel epiphyllis, minutis, rotundatis, sparcis, pulverulentis, brunneis; uredosporis globosis vel ovoideis* 24-27×20-24 μ (24,8×22), *ochraceo-cinnamomeis, tunica usque* 2,5 μ *spinulosa, poris germinativis* 5-6, 6-8 μ *latis; teleutosporis uredosporis immixtio, globulis v. ellipsoideis,* 19-23×18-21 μ (21,4×19,18 *med.*), *tunica æqualiter* (2,2 à 2,5 μ), *punctato-verrucosa, poro germinativo invisibili, pedicello hyalino, mediocriter brevi, fragili.* Hab. *in foliis vivis Coronilla variae.*

(*Travaux du Laboratoire de Botanique et de Pathologie végétale de l'Institut national agronomique.*)

821

UNE NOUVELLE MALADIE DU BANANIER EN GUADELOUPE LA " JAVANESE DISEASE "

PAR

J. Mauzé et G. Merny

On a l'habitude en Guadeloupe de mettre sur le compte du *Cercospora* toute la pathologie du Bananier. S'il est bien certain que c'est ce parasite qui est à l'origine de la majeure partie des maladies de cette plante, il est certain qu'une nouvelle affection, cette fois microbienne, vient de s'attaquer aux bananeraies de l'ile, faisant pour la première fois, semble-t-il, son apparition dans l'archipel Caraïbe. Cette maladie est la « *Javanese disease* », chimiquement et histologiquement un mélange de la maladie de Moko et de la maladie de Panama.

M. Guyot, agronome de la section antillaise de l'Institut des Fruits et Agrumes Coloniaux, avait observé, il y a déjà quelques mois, que de très nombreux plants dans une jeune plantation de Neufchateau, étaient atteints d'une maladie différente de ce que l'on voit ordinairement. Cette même maladie, il l'a retrouvée sur des plantations particulières.

M. Guyot est venu nous trouver avec des jeunes plants malades, juste arrachés et nous a demandé si nous pouvions déterminer la cause de l'affection.

Après deux mois de recherches et d'expérimentation, nous avons pu isoler un germe que nous avons identifié à un *Phytomonas*, identification que notre maître, le professeur Magrou, de l'Institut Pasteur de Paris, a bien voulu préciser lui-même, ce dont nous le remercions vivement.

Il s'agit de :

Phytomonas musae : (Gäumann) Magrou in Hauduroy et al.
Synonyme : *Pseudomonas musae* Gaumann, 1921 et *Bacterium musae* (Gaumann) Elliott, 1930.

Nous dirons tout de suite que l'immobilité du germe, sa mor-

Revue de Pathologie végétale
et d'Entomologie agricole de France
t. XXIX - N° 3 - octobre 1950

make anything satisfactory of this. This can be better done on the spot in watching its development. It is at any rate curious and I suppose somewhat allied to *Michenera artocreas*' ". Inside the packet is another label marked "*Minnsia carnea* E. & E., collected in the Lake Superior region by Miss S. Minns". The collection consists of two twigs, evidently of hemlock, with an abundance of the sclerotial phase in an excellent state of preservation. There is no evidence of an associated basidial fructification.

Dr. Shear mentions having collected this many years ago on hemlock at Alcove, New York. This collection has not been located. There are in the Bureau of Plant Industry several other collections (see "Specimens examined"), including a part of the collection made by Overholts and myself at Inlet, New York, which is apparently the first seen by Dr. Shear which showed an associated immature corticioid fructification. He also noted the resemblance of this to *Corticium roseum*.

From Dr. Shear's notes I also learned that Dr. W. W. Diehl had seen a collection of this fungus in the herbarium of the State Museum at Albany, New York, which I later borrowed through the courtesy of Dr. H. D. House. This specimen is labeled *Illosporium cupulatum* Peck ined. and was collected in July (year ?) on *Tsuga canadensis* at Sylvan Beach (Oneida Lake), New York by C. H. Peck. This collection on examination proves without doubt to be the *Minnsia carnea*. It had been examined at one time by Dr. John Dearness, and a note made by him accompanying the specimen reads as follows: "This is a curious thing. One form seems to be parasitic on the other but on dissection they seem to have the same hyphal structure. I do not get the nature or position of the spores". The "forms" referred to are evidently the peridium and the "egg". My own examination failed to reveal spores of any sort.

Dr. Roland Thaxter also knew of this fungus in the sclerotial phase as is evidenced by collections in the residue of his herbarium at Harvard University, labeled *Minnsia carnea* E. & E. There are two parts of a collection made by Thaxter at Intervale, New Hampshire, and another made at Lewes, New York, by A. H. W. Povah. One of the Intervale packets bears the following note in Thaxter's hand: "Burt, May 1920, says he never saw anything like it". An earlier collection made by Thaxter in 1887 at Cranberry, N.C. has recently been discovered by Dr. D. P. Rogers among unidentified material at the Farlow Herbarium which bears the note "apparently *Sphaerobolus*".

More recently, Dr. J. R. Hansbrough and associates at the New Haven Laboratory of Forest Pathology, following the identification of the collection on *Pinus contorta* from Oregon by Dr. Shear in 1932, have repeatedly collected this species on *Tsuga canadensis* in New England, notably in Maine, New Hampshire, and Vermont. A set of these collections was recently sent to me by Dr. Hansbrough and are listed below under "Specimens examined".

As nearly as I can determine, the name *Minnsia carnea* E. & E. ined. has appeared in the literature only once. A reference to this form was made

8|22

by Spaulding and Hansbrough (9) in connection with a study of decay of logging slash in the northeast. They say of this fungus (p. 10): "*Minnsia carnea* is so little known that it never has been scientifically described, yet it is plentiful on hemlock twigs and weakens them so that they break at the infected places". The name also appears in tables on pp. 8 and 10 of their publication.

Aleurodiscus Minnsiae sp. nov. (Figs. 1 to 7, 9, 11)

Fructificatio late effusa vel in irregularibus areolis, primo vivide roseo-alutacea, dein cremeo-alutacea vel alba, tenuiter membranacea, separabilis, margine abrupto vel attenuato; subiculum crasse tunicatis hyphis 3–4μ diam. nodoso-septatis compositum; paraphyses multae, nodulosae, ramis irregularibus brevibusque praeditae; basidia longo-cylindracea vel subclavata, 80–110 × 8–10μ, flexuosa, 4 subulatis arcuatis 7–8.5μ longis sterigmatibus praedita; basidiosporae ovoideae 12–16 × 8.5–11μ, tunicis tenuibus, hyalinis, non-amyloideis.

Fructification when mature widely effused or in irregular patches, bright pinkish buff to shell pink or pale flesh color when fresh, fading to cream buff or white, 125–200μ thick, surface at first continuous, becoming rimose in age exposing the subiculum, soft membranous, separable, margin irregular, abrupt or thinning out; subiculum made up of thick-walled hyphae, 3–4μ in diam., with capillary lumen, arranged more or less horizontally below, interwoven in the subhymenium, with regular clamps; paraphyses abundant in the hymenium, thin-walled, 1.5–2μ in diam., nodulose, with irregular peglike branches; basidia arising from deep in the subiculum, long cylindrical or subclavate 80–100 × 8–10μ, more or less flexuous, bearing four subulate, arcuate sterigmata, 7–8.5μ long; basidiospores ovoid 12–16 × 8.5–11μ, slightly flattened on one side with conspicuous apiculus, walls thin, smooth, colorless, non-amyloid.

Basidial fructification preceded or accompanied by a characteristic sclerotial disseminating phase described in the text.

Specimens examined:*

Ontario: On *Tsuga canadensis*, N. Bathurst St., Toronto, Oct. 1934, with R. F. Cain, TRT *8231*, NY; Bell's Lake, N. of Parry Sound, Sept. 22, 1935, TRT *8233*, NY, FH, BPI, OTB, IA; East of Maple, Nov. 9, 1935, TRT *8232*, NY, FH, BPI, OTB; May 5, 1936, TRT *9835*, NY, FH; June 1, 1936, with R. F. Cain, TRT *10474*; Holland River Marsh, Oct. 2, 1936, with R. F. Cain, TRT *11116*, NY, FH; June 3, 1937, TRT *11131* **type,** NY, FH, BPI, OTB, UPS; TRT *11697*; Oct. 1937, TRT *12176*, NY, FH, OTB, BPI; South of Aurora, June 1, 1936, TRT *10471*; East of Hatchley, Oct. 13, 1936, R. F. Cain, TRT *10164*; near Sutton, Sept. 23, 1936, TRT *9836*, NY, FH, BPI, OTB, IA; "Glengert", Terra Cotta, May 23, 1937, TRT *11698*; N.E. of Sharon, Oct. 17,

** Unless otherwise noted, Ontario collections were made by the writer. The herbarium abbreviations, indicating where specimens are deposited, are as proposed in the report on the standardization of herbarium abbreviations, Chronica Botanica, 5 : 142-150. 1939.*

"splash-cup" mechanism may operate in the dissemination of the sclerotia, similar to the method briefly described by Dr. G. W. Martin (7, p. 244) for the dissemination of the peridiola in *Crucibulum*. During the early period of my interest in the "Minnsia" the late Dr. A. H. R. Buller had lectured at Toronto concerning his experimental studies of this mechanism as applied to the dissemination of the peridiola of the Nidulariaceae, and of the gemmae of the liverworts and mosses. Specimens of the "Minnsia" were shown to Dr. Buller and later to Dr. H. J. Brodie, who had been associated with Dr. Buller in this study. Both agreed that the structure was such that, in all probability, the sclerotia may be disseminated by drops of rain or drippings from branches above, splashing into the cups. No experimental tests have as yet been conducted with the "Minnsia". Dr. Buller's studies of this mechanism, so far as I am aware, remain unpublished except for an abstract (2) of a paper presented to the Royal Society of Canada in 1942.

There is ample evidence, supported by field observations, that the sclerotia are disseminated and serve as propagating bodies. The "Minnsia" stage is usually at its best with fully developed sclerotia in August and early September though collections have been made in July. Later in the fall the peridia are found to be empty. These gradually shrivel and dry after the sclerotia have been disseminated but may persist to the degree that they are recognizable during the winter months and well into early spring.

The sclerotia when planted on nutrient agar develop a rapidly growing mycelium from all sides and pure cultures are easily obtained from the marginal hyphae of such colonies. In nature, if a sclerotium comes to rest on the side of a twig or branch, it develops toward the under side a felt of mycelium which ultimately becomes a basidial fructification. There is some evidence that such colonies are at first rather superficial with very little development of mycelium in the bark though no detailed histological study has been made. Occasionally, where a fruiting body of the "Minnsia" stage is developed toward the side of a twig, mycelium may grow out from the base of the peridium.

In the development of the "Minnsia" stage the structure is at first a small, more or less sphaerical body which appears to break out from the superficial layers of the bark (Fig. 7). As it enlarges, a cleavage zone develops which results in the separation of an outer layer which becomes the flaring peridium, and an inner core which is left as the egglike sclerotium. The latter, when fully mature, is loosely attached at the base and easily removed. While there is no evidence of any specialized outer layer to the sclerotia, the hyphae have thick walls which presumably gelatinize, in the presence of moisture, sufficiently that the sclerotia adhere to any surface on which they come to rest. They are bright salmon in color when fresh.

Aleurodiscus Minnsiae, as is evident from the hosts listed above, has so far been collected most commonly on *Tsuga canadensis* in northeastern North America and probably occurs throughout the range of that host. No collections have yet been made on other coniferous hosts in that region. In the

west, however, collections have been made on two species of *Pinus*, *Tsuga heterophylla*, *Pseudotsuga taxifolia*, and *Abies lasiocarpa* bearing a fungus which appears to be morphologically identical with the "Minnsia carnea" stage of

FIG. 1. *Aleurodiscus Minnsiae, basidia, spores, and paraphyses.*

FIG. 2. *Aleurodiscus Pini, basidia, spores, and paraphyses.* (*Reproduced at approximately ×1000.*)

the eastern species. Dr. D. P. Rogers informs me that he, also, had collected the "Minnsia" in Oregon on *Pseudotsuga* but no specimens are available and were perhaps not preserved. Unfortunately no basidial fructification is associated with any of these western collections except the ones from California and British Columbia on *Pseudotsuga taxifolia* and the one on *Abies lasiocarpa* from the latter province. The fructifications are immature. It is not possible, therefore, to state with finality that the western collections are *A. Minnsiae*. They are included in the above list with some hesitation.

While it seems probable that the basidial fructifications on these hosts, when available in good sporulating condition, will prove to be inseparable from *A. Minnsiae*, it must be recognized that biologically distinct forms or races may exist which might be indistinguishable morphologically. Quite recently preliminary evidence has been obtained that the western forms may show differences. During the summer of 1949 Dr. Mildred K. Nobles made cultures from the sclerotia of the two collections from British Columbia listed above on *Pseudotsuga taxifolia* and *Abies lasiocarpa* which she was kind enough to send me. Comparison of these with a culture of the eastern form on *Tsuga canadensis*, isolated in October 1949 from sclerotia, indicates a decidedly different growth rate of the mycelium. Since no detailed study of the growth rate of collections made of the eastern form from different collections or localities is available, the full significance of the observation recorded above cannot be properly evaluated at present. It is obvious that a further study of western collections on different hosts in comparison with the eastern form is desirable.

A notable feature of *A. Minnsiae* is the fact that the basidia mature in the spring, commonly in late May or June. Ontario collections of the basidial fructifications made in the fall, winter, or early spring are sterile but show immature basidia in various stages of development depending on the date of collection. This is true also of the form on *Pinus Strobus* to be described later in this paper and of a form of *A. roseus* on *Populus* discussed on p. 74. It is not, however, true for all collections commonly labeled *Corticium roseum* or *Aleurodiscus roseus* as found in herbaria. Collections from Ontario on *Acer* and on undetermined wood, for example, are fruiting in September and October. Of 33 collections in the University of Toronto herbarium made in various parts of the United States on broad-leaved hosts, 14 are sterile, 11 are producing basidia in the fall or winter, and 8 are fruiting in the spring. The related European species, *A. polygonoides*, evidently is in fruiting condition in the fall, judging from the few collections available.

In 1915 Burt (3) recorded *Eichleriella Leveilliana* (B. & C.) Burt as occurring in New York State on the basis of three collections made by S. H. Burnham at Hudson Falls and one by G. W. Clinton at Buffalo labeled *Stereum Leveillianum* B. & C. House (5, pp. 22, 32) also records the species from New York based on another collection made by Burnham, the identification of which is credited to Burt. These records are decidedly out of range for this species, which is said to be common only in the southern states and in tropical America. The Burnham collections, cited by Burt, are on twigs of *Tsuga canadensis*

Aleurodiscus Minnsiae. FIG. 3. *Under side of twigs of Tsuga canadensis showing immature basidial fructifications as they appear in September. Natural size.* FIG. 4. *Basidial fructification when in fruiting condition in late May or early June.* FIG. 5. *Upper side of two of the twigs from Fig. 3, showing the "Minnsia" stage. Natural size.* FIG. 6. *A portion of one of the twigs on Fig. 5 enlarged to twice the diameter.* FIG. 7. *The "Minnsia" stage still further enlarged. Note some empty peridia and a few small undifferentiated structures before the separation into peridium and sclerotium has occurred.*

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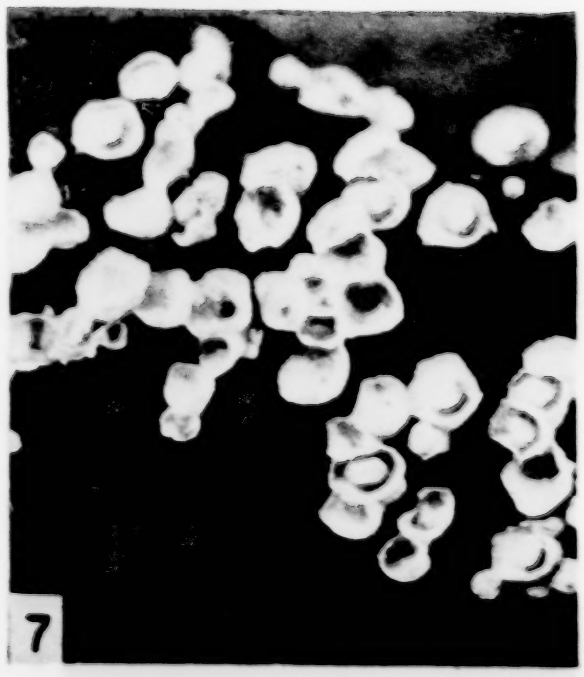
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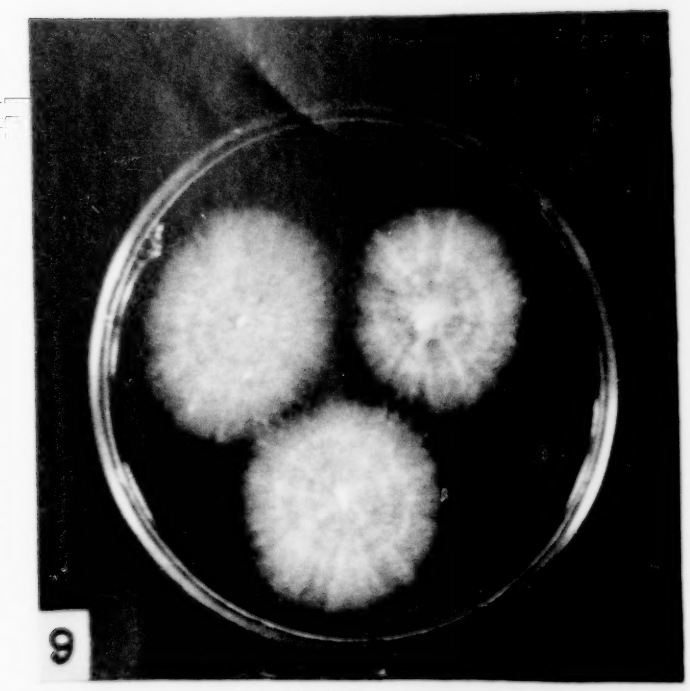

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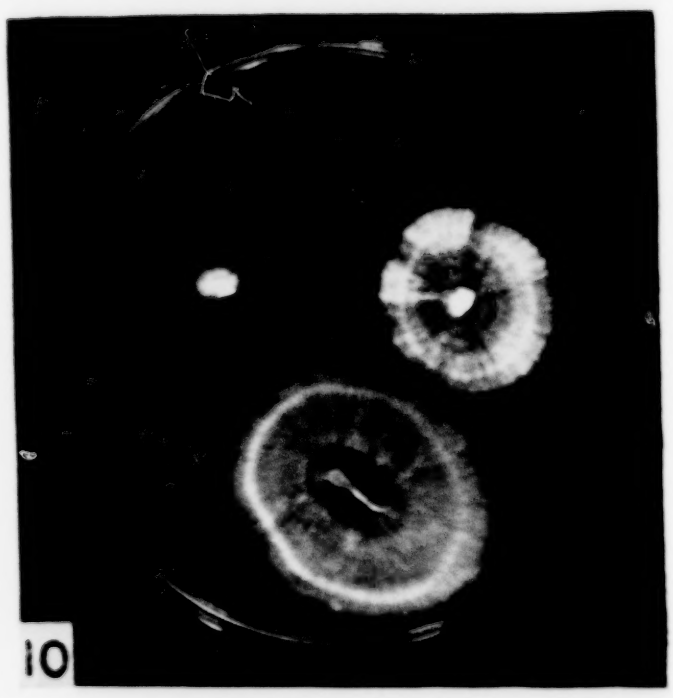

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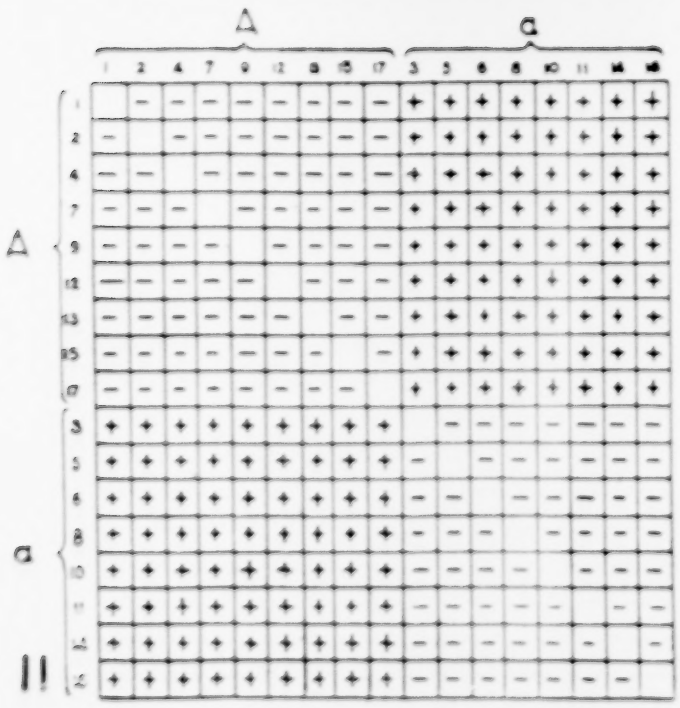

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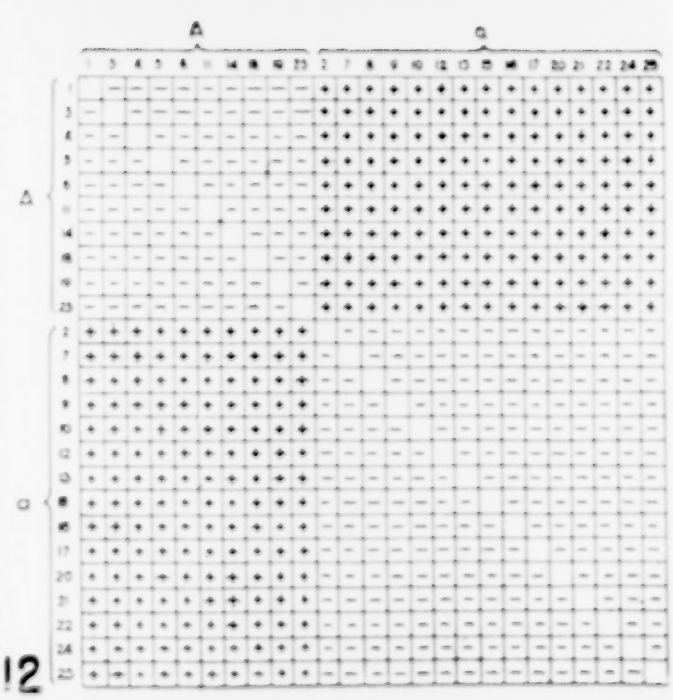


12

8|25

with the exception of one which is on *Populus tremuloides*. The collections on *Tsuga*, together with two additional ones on that host made at other dates during the same year by Burnham at Hudson Falls, all prove to be *Aleurodiscus Minnsiae* and are listed above. The one on *Populus* (MO *44170*, CU PP*27556*) is a form of *Aleurodiscus roseus* occurring not uncommonly on the under side of dead branches of *Populus* and *Salix* in the tree. The Burnham collections were all made in the winter between December and March and consist of sterile basidial fructifications. At this season of the year and later the associated "Minnsia" stage on the *Tsuga* collections, which is at its best in the preceding summer and early fall, has often largely disappeared. Recognizable remnants are, however, present on some of the twigs which assist in making the identification positive. The collection labeled as having been made by G. W. Clinton at Buffalo, N.Y. is something quite different. It is on the bark of some deciduous leaved host and is sterile. It has been examined recently at my request by Dr. G. W. Martin who reports that it is in all probability a young phase of *E. Leveilliana*. The out-of-range records from New York for this species are therefore reduced to one.

Comparative Culture Studies

During the early period when *Aleurodiscus Minnsiae* was under observation, another form occurring on the under side of dead branches of living *Pinus Strobus* was frequently collected. This also was obviously related, but quite different in general appearance from *A. Minnsiae* and from the usually collected form of *A. roseus*. There is never any evidence of an associated "Minnsia" stage.

As noted above *A. Minnsiae* produces its spores in the late spring; fall and winter collections are sterile, but show immature basidia. This is true also of the form on *Pinus*. A set of single-spore cultures was obtained from the forms on both hosts in the spring of 1937. The only form of *A. roseus* available at the time was one which occurs commonly on the under side of dead branches in trees of *Populus tremuloides*. This also produces its basidiospores in late May or early June. A set of monospores was obtained from this form also.

A comparison of polysporous cultures was first made as an indication of comparative growth rate. Fig. 10 shows colonies from the three sources planted side by side on the same plate. The smallest colony is from *Populus*, the largest one from *Pinus*, and the medium one is of *A. Minnsiae* from *Tsuga*. The comparative growth rates were therefore indicative of different entities though no detailed study was attempted.

FIG. 8. *Aleurodiscus Pini showing mature basidial fructifications. Natural size.* FIG. 9. *Aleurodiscus Minnsiae. Comparison of colonies from tissue cultures secured from developing basidial fructifications, from the peridium of the "Minnsia" stage and from the sclerotium.* FIG. 10. *Comparison of polysporous cultures, upper left colony of a form of Aleurodiscus roseus from Populus; upper right, Aleurodiscus Minnsiae; lower colony of Aleurodiscus Pini.* FIG. 11. *Interfertility table for Aleurodiscus Minnsiae.* FIG. 12. *Same for Aleurodiscus Pini.*

An examination of the monospore cultures derived from the form of *A. roseus* on *Populus* showed that all the hyphae developed clamps at the septa, which was not true of monospore cultures derived from fructifications on *Tsuga* or *Pinus*. This fact, together with the decided difference in growth rate, clearly indicates that the form on *Populus* is biologically distinct from the forms occurring on *Tsuga* and *Pinus*. It is presumably "homothallic". Since no other form of more typical *A. roseus* was available for comparison in culture, it cannot be determined from the evidence available whether or not this form on *Populus* is distinct from the more commonly recognized form. As stated above, this form matures its basidiospores in late spring or early summer while some collections assigned to *A. roseus* from farther south are known to produce their basidiospores in late summer or early fall. It is quite possible that the form under discussion may prove worthy of segregation when a comparative study of cultures from more sources is available. This form on *Populus* is apparently the same as the sterile form collected in February by S. H. Burnham, mentioned on p. 72, which was assigned by Burt to *Eichleriella Leveilliana*.

The hyphae of monosporous cultures secured from fertile fructifications of *A. Minnsiae* and from the form on *Pinus Strobus* remained clampless. Each set was paired in all possible combinations and the usual type of interfertility tables were prepared and are reproduced on Plate 11. Fig. 11 is of *Aleurodiscus Minnsiae*, while Fig. 12 is the table for the form on *Pinus*. Both are heterothallic, in the sense that the term is usually used in the higher basidiomycetes, and apparently of the bipolar type of interfertility, though perhaps an insufficient number of cultures was available to rule out the possibility of tetrapolarity, especially in the case of *A. Minnsiae*. Cultures 2, 3, 4, and 5 of *A. Minnsiae* were paired with Cultures 1, 2, 3, and 7 of the form on *Pinus*. No clamps resulted in any of these pairings, showing that the two forms are incompatible and therefore biologically distinct. I am indebted to Dr. A. J. Skolko for having isolated the sets of monospore cultures and for conducting the interfertility tests and preparing the tables.

Aleurodiscus Pini

Because of the evidence furnished by the comparative culture studies reviewed above and the existence of certain morphological differences which are considered significant, together with the evidence that *A. roseus* is to be interpreted as a collective species, it has been decided to describe the form on *Pinus Strobus* as a new species.

Aleurodiscus Pini sp. nov. (Figs. 2, 8, 12)

Fructificatio primo parum roseo-alutacea, deinde cremeo-alutacea, 90–110μ crassa, infrequenter continue effusa, saepe in parvis interruptis areolis sparsa, tenuiter membranacea, margine attenuato; subiculum angustum, hyphis

INDEX OF FUNGI
Vol. 2 Diagnoses

8|26

tenuiter tunicatis 3–3.5μ diam., nodoso-septatis; paraphyses multae, supra ramosae, 2.5–3μ diam., tenuiter tunicatae; basidia longo-cylindracea vel subclavata, 65–90 × 5–9 μ, 4 subulata, arcuata, 6–8μ longa sterigmata gerentia; basidiosporae ellipsoideae, 10–12 × 6.5–7.5μ, tunicis tenuibus, hyalinis, non-amyloideis.

Fructification pinkish buff when fresh, fading to cream buff, 90–110μ thick, rarely continuously effused, more commonly in small discontinuous patches, soft membranous, margin thinning out; subiculum poorly developed, hyphae with walls only slightly or not at all thickened, 3–3.5μ in diam., with clamps; paraphyses abundant, flexuous, branching above, 2.5–3μ in diam., walls thin; basidia long cylindrical or subclavate, sometimes subventricose below, 65–90 × 5–9μ, arising from near the base of the subiculum, bearing 4 subulate slightly arcuate sterigmata, 6–8μ long; basidiospores ellipsoid, 10–12 × 6.5–7.5μ, slightly flattened below on one side, with prominent apiculus, walls thin, smooth, colorless, nonamyloid.

Specimens examined:

Ontario: On *Pinus Strobus*, woods E. of Maple, Nov. 2, 1935, TRT *8230*, FH, NY, BPI, OTB, IA, UPS; June 1, 1936, R. F. Cain, TRT *10472*; N. o Summit Golf Club, N. of Richmond Hill, Oct. 31, 1936, TRT *10828;* May 20, 1937, TRT *11702*, FH, NY, OTB; June 3, 1937, TRT *11703* **type,** FH, NY, OTB, BPI, IA, UPS; June 1, 1939, TRT *13241*, FH, NY, BPI, IA; woods W. of Maple; June 11, 1937, TRT *11701*; Oct. 6, 1937, TRT *11640*, FH, NY, BPI, OTB; June 4, 1938, TRT *13325*; Bear Island, Lake Timagami, Aug. 19, 1937, TRT *11611*; N. of Holland River Marsh, May 29, 1937, TRT *12688*; N. of Cathcart, Brandt Co., May 6, 1938, R. F. Cain *13009*; Oakland Swamp, Brandt Co., June 12, 1939, R. F. Cain, TRT 16494, FH, NY, BPI, OTB, IA, UPS; Oct. 9, 1939, TRT *15094*, *15095*; Constance Bay, N.W. of Ottawa, June 30, 1938, TRT *13561*, FH, NY, BPI, OTB, IA; Lake of Two Rivers, Algonquin Park, Sept. 15, 1938, TRT *13438*; June 13, 1942, TRT *17631*, FH, NY, BPI, OTB, IA, UPS; Pt. Alexander, N. of Chalk River, Aug. 31, 1941, TRT *17428*, UPS; Petawawa Forest Reserve, Chalk River, Sept. 2, 1941, TRT *17357*.

Quebec: On *Pinus Strobus*, Morgan's woods, near Ste. Anne de Bellevue, Aug. 25, 1941, H. S. Jackson, TRT.

Pennsylvania: On *Pinus Strobus*, Ross Run, Huntingdon Co., Oct. 27, 1931, L. O. Overholts *13785*, TRT; Apr. 17, 1932, L.O.O. *22401*, TRT; Feb. 19, 1932, L.O.O. *16729* and R. W. Davidson, TRT; June 4, 1936, L.O.O. *19297*, TRT; English Center, Lycoming Co., May 8, 1936, L.O.O. *19271*, TRT; Shaver's Creek, Huntingdon Co., Feb. 2, 1936, L.O.O. *19221*, TRT; McAlvey's Fort, Huntingdon Co., Aug. 15, 1934, L.O.O. *17642*, TRT. (These specimens labeled *Corticium roseum* or *C. roseum* var. *Strobi* n. var. (ined.).)

Meliolaceae

For the species of *Meliola* and related genera we have followed Hansford and Deighton (West African Meliolineae, Mycological Papers, I.M.I., No. 23, March 1948) in arranging them under the families of host plants numbered according to Hutchinson's classification.

Annonaceae, 8
Aristolochiaceae, 24
Piperaceae, 28
Polygonaceae, 57
Cucurbitaceae, 103
Myrtaceae, 116
Melastomaceae, 120
Combretaceae, 121
Tiliaceae, 128
Sterculiaceae, 130
Malvaceae, 132
Malpighiaceae, 133
Euphorbiaceae, 136
Caesalpiniaceae, 146
Mimosaceae, 147
Papilionaceae, 148
Vitaceae, 193
Burseraceae, 196
Meliaceae, 197
Sapindaceae, 198
Anacardiaceae, 205
Apocynaceae, 230
Rubiaceae, 232
Compositae, 238
Gentianaceae, 239
Solanaceae, 250
Convolvulaceae, 251
Bignoniaceae, 257
Verbenaceae, 263
Labiatae, 264
Musaceae, 287
Zingiberaceae, 290
Araceae, 302
Palmae, 314
Cyperaceae, 331
Gramineae, 332
Pteridophyta (see p. 18)

Family 8. Annonaceae

Meliola xylopiae F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 257, 1928.

On *Xylopia aromatica*, St. Joseph, 8.i.1946, I.C.T.A. 809.

[Type collections Stevens 1102 on *Xylopia grandiflora*, Panama, and Stevens 988 on *X. frutescens*, Panama.]

Family 24. Aristolochiaceae

Meliola aristolochiicola F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 278, 1928.

On *Aristolochia* sp., Aripo valley, 3.i.1948, I.C.T.A. 1812.

[Type collection Stevens 1005 on *Aristolochia maxima*, Panama.]

Family 28. Piperaceae

[**Irenina cyclopoda** (F. L. Stevens) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 452, 1927.

Meliola cyclopoda F. L. Stevens in *Illinois biol. Monogr.*, ii, p. 16, 1916.

On *Piper* sp., Cumuto, 16.viii.1922, Stevens 877.

Type collection Stevens 7871 on *Pseudelephantopus*, Puerto Rico.]

Irenina glabroides (F. L. Stevens) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 463, 1927.

Meliola glabroides F. L. Stevens in *Illinois biol. Monogr.*, ii, p. 18, 1916.

On *Piper aduncum*, Maracas bay rd., 3.iii.1947, I.C.T.A. 1328; Aranjuez estate, San Juan, 7.iii.1947, I.C.T.A. 1359.

Both collections on the type host (*Piper aduncum*) match Stevens's material. A very small colony from the type shows considerable variation in measurements and in the shape of the hyphopodia; spores 37–44 × 16–19μ, head cells 12–18 × 11–16μ, stalk cells 6–12 × 6–8μ, mycelial cells 14–26 × 6–8μ.

827

[Type collection Stevens 3371 on *Piper aduncum*, Puerto Rico.]

Specimens collected on *Cestrum latifolium* (Solanaceae), *Stachytarpheta cayennensis* and *S. jamaicensis* (Verbenaceae), and *Protium* sp. (Burseraceae) are provisionally referred to this species.

[**Irenopsis tortuosa** (Wint.) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 439, 1927.
Meliola tortuosa Wint. in Gaillard, Le Gen. Meliola, p. 67, 1892.
On *Piper peltatum*, Cumuto, 16.viii.1922, Stevens 876. A white hyperparasite was found upon this specimen.
Type collection E. Ule on *Piper* and on *Dicksonia rubiginosa*, Brazil.]

Meliola piperis Earle in *Muhlenbergia*, 1, p. 12, 1901.
On *Piper aduncum*, San Juan, 20.xii.1944, I.C.T.A. 345; Santa Cruz, 14.ii.1948, I.C.T.A. 1888.
[Type collection Heller 4359b on *Piper*, Puerto Rico.]

Family 57. Polygonaceae

[**Meliola coccolobae** F. L. Stevens and Tehon in *Mycologia*, xviii, p. 5, 1926.
On *Coccoloba* sp., Cumuto, 16.viii.1922, Stevens 903.
Type collection Stevens 655 on *Coccoloba*, British Guiana.]

Family 103. Cucurbitaceae

Irenina anguriae F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 464, 1927.
On *Cayaponia subsessilis*, San Juan, 7.iii.1947, I.C.T.A. 1338.
On *Gurania spinulosa*, Arima–Blanchisseuse rd., 11.iii.1945, I.C.T.A. 498; Talparo, 25.i.1948, I.C.T.A. 1842.
[Type collection Stevens 205 on unknown Cucurbitaceae, British Guiana.]

Irenopsis melothriae Baker and Dale, sp. nov.
Plagulae epiphyllae, atrae, ad 2·5 mm. diam. *Mycelium* ex hyphis brunneis, sinuosis, 5–8μ cr. (cellulis 22–35μ longis), plerumque opposite ramosis (50–60°), reticulatis compositum. *Hyphopodia capitata* alternata vel unilateralia, 14–22μ longa; cellula basali 4–7μ, cylindracea; cellula apicali subglobosa vel ovata, integra, recta vel rarius recurvata, 12–16$\times$10–14μ. *Hyphopodia mucronata* numerosa, plerumque opposita, ampullacea, 14–22$\times$6–8μ, collo 3μ cr. *Setae myceliales* nullae. *Perithecia* dispersa, atra, globosa, usque ad 175μ diam., verrucosa, sursum setis 2–7, brunneis, continuis, uncinatis, obtusis, usque ad 90$\times$4μ ornata. *Sporae* pallide brunneae, ellipsoideae, 4-septatae, constrictae, 33–40$\times$13–16μ.
Hab. in foliis *Melothriae trilobatae*, Trinidad, La Seiva valley, 5.iv.1946, Baker, I.C.T.A. 997 (typus); Arima–Blanchisseuse rd., 11.iii.1945, I.C.T.A. 497, and 17.viii.1947, I.C.T.A. 1547.

Family 116. Myrtaceae

Meliola psidii Fr. in *Linnaea*, v, p. 549, 1830.
On *Psidium guajava*, St. Augustine, 13.viii.1922, Stevens 831; 2.xi.1944, I.C.T.A. 253; Cumuto, 16.viii.1922, Stevens 942.

Family 250. Solanaceae

Irenina glabroides (F. L. Stevens) F. L. Stevens.
On *Cestrum latifolium*, Tabaquite forest, 9.iii.1947, I.C.T.A. 1362.
See notes on this species under Piperaceae.

Irenina portoricensis (Toro) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 453, 1927.
Irene portoricensis Toro in *Mycologia*, xvii, p. 141, 1925.
On *Acnistus arborescens*, Arima–Blanchisseuse rd., 17.viii.1947, I.C.T.A. 1549.
[Type collection Whetzel, Kern, & Toro 2527 on *Acnistus arborescens*, Puerto Rico.]

Irenopsis solani (F. L. Stevens) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 439, 1927.
Meliola solani F. L. Stevens in *Illinois biol. Monogr.*, ii, p. 15, 1916.
On *Solanum stramonifolium*, Arima–Blanchisseuse rd., 17.viii. 1947, I.C.T.A. 1550.
[Type collection Stevens 5750 on *Solanum jamaicense*, Puerto Rico.]

Family 251. Convolvulaceae

Meliola clavulata Wint. in *Hedwigia*, xxv, p. 98, 1886.
On *Ipomoea batatas*, St. Augustine, 13.iv.1944, I.C.T.A. 137; 30.iii.1944, I.C.T.A. 141; 14.x.1944, I.C.T.A. 232.
On *Ipomoea tiliacea*, Caura valley, 22.xi.1944, I.C.T.A. 284; 18.ii.1947, I.C.T.A. 1112.
On *Merremia aegyptia*, St. Joseph, 29.xi.1944, I.C.T.A. 303.
On *Merremia glabra*, St. Clair, 15.viii.1922, Stevens 897; Pitch lake, 23.iii.1947, I.C.T.A. 1375; Siparia quarry, 2.x.1947, I.C.T.A. 1706.
On Convolvulaceae, Fondes Amandes, 19.i.1921, E. M. Wakefield 278 in Herb. R.B.G. Kew.
[Type collection Winter on Convolvulaceae, St. Thomas Is., Africa.]

Meliola malacotricha Speg. in *An. Soc. cient. Argent.*, xxvi, No. 59, 1888.
On *Ipomoea tiliacea*, St. Augustine, 18.ii.1947, I.C.T.A. 1112.
On *Merremia glabra*, Siparia quarry, 2.x.1947, I.C.T.A. 1706.
Often intimately mixed with *M. clavulata*, but recognizable by the opposite capitate hyphopodia.
[Type collection Spegazzini on *Dichondra*, Paraguay.]

Family 257. Bignoniaceae

Irenopsis bignoniacearum F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 442, 1927.
On Bignoniaceae, forest south of Arima, 29.iii.1947, I.C.T.A. 1390.
[Type collection Stevens 81 on Bignoniaceae indet., Panama.]

[**Meliola crescentiae** F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 240, 1928.
Type collection on *Crescentia* sp., Cumuto, Trinidad, 18.viii.1922, Stevens 940.]

Meliola cydistae F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 193, 1928.
On *Phryganocydia corymbosa*, Arena forest, 4.iv.1947, I.C.T.A. 1402.
[Type collection Stevens 133, 1.ix.1924, on *Cydista*, Panama.]

Meliola dentifera Syd. in *Ann. mycol., Berl.*, xiv, p. 78, 1916.

On Bignoniaceae, Palo Seco, 29.ii.1948, I.C.T.A. 1907 and I.C.T.A. 1908.

No authentic material has been examined; these collections agree closely with Sydow's description except that many of the setae are more branched at the apex.

[Type collection Sydow 3528, April 1911, on *Arrabidaea nicotianiflora*, Brazil.]

Family 263. Verbenaceae

Irenina glabroides (F. L. Stevens) F. L. Stevens.

On *Stachytarpheta cayennensis*, St. Joseph, 6.vi.1944, I.C.T.A. 161; St. Augustine, 18.ii.1947, I.C.T.A. 1118; Mt. Dillon, Tobago, 26.viii.1947, I.C.T.A. 1576.

On *Stachytarpheta jamaicensis*, San Juan, 17.i.1945, I.C.T.A. 411.

On *Stachytarpheta* sp., St. Clair, 15.viii.1922, Stevens 879; Maracas valley, 21.i.1921, E. M. Wakefield 276 in Herb. R.B.G. Kew.

See notes under Piperaceae.

Irenina sepulta (Pat.) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 450, 1927.

Meliola sepulta Pat. apud Stevens in *Illinois biol. Monogr.*, ii, p. 14, 1916.

On *Avicennia nitida*, Erin, 29.ii.1948, I.C.T.A. 1901.

[Type collection Heller 390 on *Avicennia nitida*, Puerto Rico.]

Meliola aegiphilae F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 208, 1928.

On *Aegiphila integrifolia*, Talparo, 25.i.1948, I.C.T.A. 1841.

[Type collection Stevens 221 on *Aegiphila*, British Guiana.]

Meliola ambigua Pat. & Gaill. in *Bull. Soc. mycol. Fr.*, iv, p. 104, 1888.

On *Lantana* spp., St. Augustine, 28.xii.1944, I.C.T.A. 336, 337, 338.

These three collections have not been compared with type material, because none is available at Kew, but they agree exactly with the description given by Sydow, *Fungi Exot. Exsicc.* 614, and Stevens 8025.

From collections in Herb. I.M.I. and in Herb. R.B.G. Kew there appears to be little difference between this species and *M. sakawensis* P. Henn.

[Type collection Patouillard and Gaillard on Labiatae, *Lantana*, &c., Venezuela.]

Family 264. Labiatae

Irenina hyptidicola (F. L. Stevens) F. L. Stevens in *Ann. mycol., Berl.*, xxv, p. 455, 1927.

Meliola hyptidicola F. L. Stevens in *Illinois biol. Monogr.*, ii, p. 16, 1916.

On *Hyptis atrorubens*, Piarco, 11.xii.1945, I.C.T.A. 767.

On *Hyptis mutabilis*, Rochard Douglas Reserve, 1.x.1947, I.C.T.A. 1704.

[Type collection Stevens 8130 on *Hyptis lantanifolia*, Puerto Rico.]

Family 287. Musaceae

Meliola macrospora Baker & Dale, sp. nov.

Plagulae epiphyllae, atrae, densae, 1–2 cm. diam. *Mycelium* ex hyphis atrobrunneis, rectis, 7–8 μ crassis (cellulis 40–60 μ longis), opposite vel irregulariter ramosis (15–45°), reticulatis compositum. *Hyphopodia capitata* alternata, rarissime opposita, recta, ad 40 μ longa, cellula basali cylindracea,

10–15 μ longa, cellula apicali ellipsoidea vel plerumque 2–3 lobata, 15–20 × 10–15 μ. *Hyphopodia mucronata* pauca, dispersa, alternata, arcte ampullacea, 30–40 × 8–10 μ, collo recto, angusto, ad 18 × 5 μ. *Setae myceliales* numerosae, dispersae, atrae, simplices, acutae, plerumque prope medium recurvatae, usque ad 400–500 × 10 μ. *Perithecia* dispersa, globosa, atra, levia, 120–175 μ diam. *Sporae* atrobrunneae, subellipsoideae, utrinque rotundatae, 4-septatae, leniter constrictae, 62–72 × 18–23 μ.

Hab. in foliis *Heliconiae bihai*, Heights of Aripo, Trinidad, 24.xii.1947, Baker I.C.T.A. 1799 (typus).

Family 290. Zingiberaceae

Meliola longistipitata F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 191, 1928.

On *Costus* sp., La Seiva valley, E. M. Wakefield 204, 16.i.1921, in Herb. R.B.G. Kew.

[Type collection Stevens 1186 on *Dimerocostus uniflorus*, Panama.]

Family 302. Araceae

Meliola dieffenbachiae F. L. Stevens in *Illinois biol. Monogr.*, ii, p. 62, 1916.

On *Dieffenbachia* cf. *picta*, Cumuto, 16.viii.1922, Stevens 959.

On *Spathiphyllum cannaefolium*, La Seiva valley, 5.iv.1946, I.C.T.A. 994.

[Type collection Stevens 8148 on *Dieffenbachia seguine*, Puerto Rico.]

Family 314. Palmae

[**Meliola mauritiae** F. L. Stevens in *Ann. mycol., Berl.*, xxvi, p. 215, 1928.

Type collections on *Mauritia* sp., Guanapo, 16.viii.1922, Stevens 908 and 925.]

Family 331. Cyperaceae

Meliola circinans Earle in *Bull. N.Y. bot. Gdn.*, iii, p. 304, 1905.

On *Lagenocarpus tremulus*, Cumuto, 16.viii.1922, Stevens 907 (overgrown with *Helminthosporium* sp.).

On *Rhynchospora glauca*, Mausica savannah, 10.i.1945, I.C.T.A. 400; Long Stretch forest, 9.iii.1947, I.C.T.A. 1346.

[Type collection Heller 6384 on Cyperaceae, Puerto Rico.]

An easily identified species with characteristic apiculate spores.

Family 332. Gramineae

Meliola panici Earle in *Muhlenbergia*, i, p. 12, 1901.

On *Lasiacis sorghoidea*, Cumuto, 16.viii.1922, Stevens 884.

On *Lasiacis patentiflora*, St. Augustine, 22.xii.1944, I.C.T.A. 340; Piarco, 10.i.1945, I.C.T.A. 383; Mt. St. Benedict, 15.xii.1945, I.C.T.A. 766.

On *Oplismenus hirtellus*, hill north of Tunapuna, 8.ii.1947, I.C.T.A. 1078.

[Type collection Heller 4343 on *Panicum*, Puerto Rico.]

Pteridophyta

Meliola pteridicola F. L. Stevens in *Illinois biol. Monogr.*, ii, p. 28, 1916.

On *Lygodium polymorphum*, Aripo valley, 3.i.1948, I.C.T.A. 1805.

On a fern, Maracas bay rd., 3.iii.1947, I.C.T.A. 1324.

[Type collection Stevens 7814 on *Aneimia adiantifolia*, Puerto Rico.]

829

Trichothyrium dubiosum (Bommer & Rous.) Theiss. in *Beih. bot. Zbl.*, xxxii, Abt. ii, p. 8, 1914.

On various Meliolines on:

Hyptis pectinata (L.) Poit., Caura valley, 22.xi.1944, I.C.T.A. 271.

Costus spiralis Rosc., Caura valley, 22.xi.1944, I.C.T.A. 285.

Hyptis capitata (L.) Jacq., Nonpareil Estate, 6.xii.1944, I.C.T.A. 311.

Adiantum sp., Diego Martin, 6.xii.1944, I.C.T.A. 318.

Sipanea pratensis Aubl., Piarco, 10.i.1945, I.C.T.A. 382.

Eschweilera subglandulosa (Steud.) Miers, Arena forest, 21.ii.1945, I.C.T.A. 490.

Pterolepis glomerata (Rottb.) Miq., La Seiva valley, 5.iv.1946, I.C.T.A. 998.

Miconia racemosa (Aubl.) DC., Rio Claro, 9.iii.1947, I.C.T.A. 1350.

Tabebuia serratifolia Nichols, Arena forest, 4.iv.1947, I.C.T.A. 1394.

Triumfetta lappula L., St. Augustine, 18.ii.1947, I.C.T.A. 1113.

Warczewiczia coccinea (Vahl) Kl., Tabaquite forest, 9.iii.1947, I.C.T.A. 1358.

Stachytarpheta cayennensis (L.C. Rich.) Vahl, St. Augustine, 18.ii.1947, I.C.T.A. 1118.

This species is common everywhere, forming plate-like masses of mycelium and radiate thyriothecia on the mycelium of many Meliolines, often suppressing the development of perithecia and setae in the host colonies so that their identification becomes impossible.

Dimerina patouillardii Theiss. in *Ann. mycol., Berl.*, x, p. 5, 1912.

On a Melioline on *Borreria laevis* (Lam.) Griseb., Diego Martin, 2.x.1944, I.C.T.A. 214; Arena forest, 16.iv.1947, I.C.T.A. 1421.

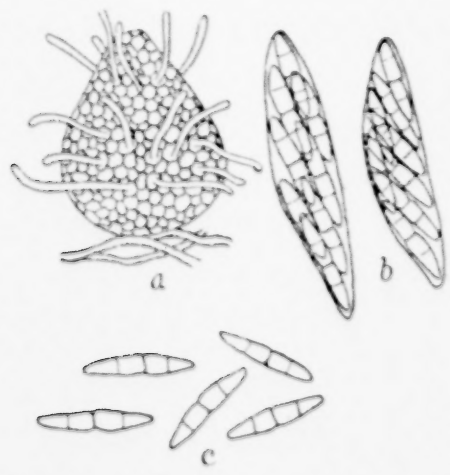


FIG. 3. *Calonectria inconspicua*. (a) perithecium ×250; (b) asci ×1,000; (c) ascospores ×1,000

Calonectria inconspicua Wint. in *Rev. mycol.*, vii, p. 207, 1885.

On *Meliola* sp. on *Tontanea guianense* Aubl., Aripo valley, 3.i.1948, I.C.T.A. 1809.

On *Meliola aegiphilae* on *Aegiphila integrifolia*, Talparo, 25.i.1948, I.C.T.A. 1841.

[**Neopeckia diffusa** (Schw.) Starb. in *Bih. svensk. VetenskAkad. Handl.*, xix, p. 30, 1894.

On dead wood and twigs, Seaver 2985 and 3084 (see *Mycologia*, xiv, p. 237, 1922).]

Neurospora sitophila Shear & Dodge in *J. agric. Res.*, xxxiv, p. 1026, 1927.

St. Clair, 12.i.1921 (sub *Monilia carbonaria* Cooke) E. M. Wakefield 139 in Herb. R.B.G. Kew.

Very common on burnt sugar-cane, where the conidia are easily visible as pink, dusty masses, especially in the dry season.

Physalospora andirae Stev. in *Trans. Illinois Acad. Sci.*, x, p. 184, 1917.

On *Andira inermis* H.B.K., St. Augustine, 7.xii.1944, I.C.T.A. 322; French Fort hills, Tobago, 24.viii.1947, I.C.T.A. 1588.

Physalospora eleocharidis Baker & Chardon sp. nov.

Perithecia in caulibus foliisque immersa, dispersa vel in lineas longitudinales aggregata, globosa vel subglobosa, ad 1 mm. diam., pariete atro-brunneo,

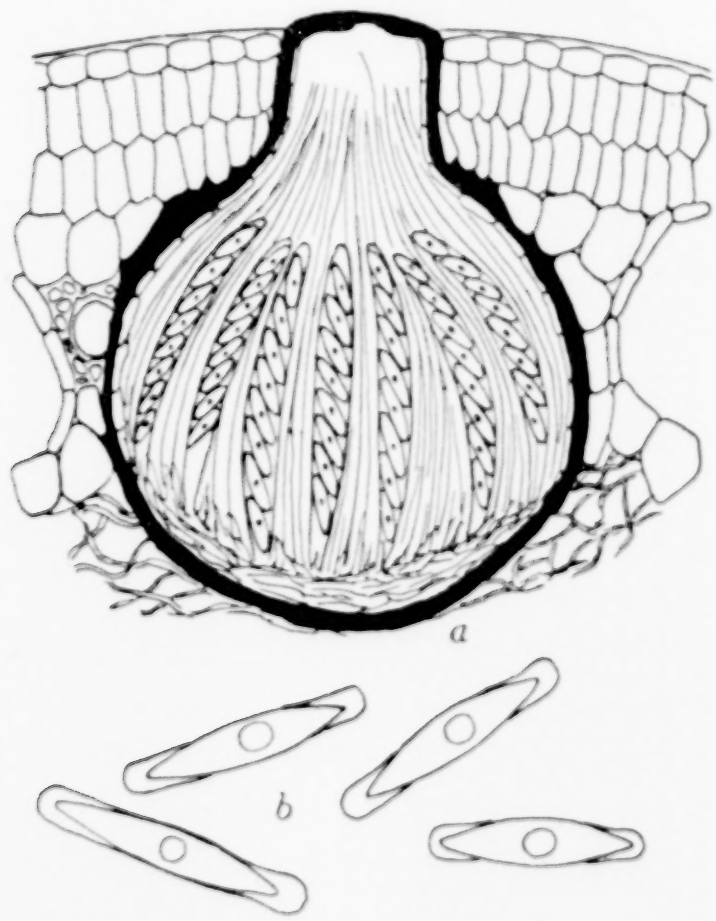


FIG. 8. *Physalospora eleocharidis*. (a) perithecium ×125; (b) ascospores ×500.

colloque atro, minuto, per superficiem hospitis nonnihil erumpente praedita, 100–150 μ alta, 80–120 μ lata. *Asci* cylindracei, breviter stipitati, apice incrassati, 100–150×12–17 μ. *Ascosporae* 8, oblique uniseriatae vel inordinatae, 1-cellulatae, hyalinae, naviculares, utrinque obtusae et incrassatae, 34–40×6–8 μ. *Paraphyses* filiformes.

Hab. in caulibus foliisque *Eleocharidis interstinctae*, Piarco savannah, Trinidad, 11.xii.1945, Baker I.C.T.A. 754 (typus); same locality, 10.i.1945, I.C.T.A. 391.

830

Physalospora rhodina (Berk. & Curt.) Cooke in *Grevillea*, xvii, p. 92, 1889 (fide Stevens in *Mycologia*, xviii, p. 208, 1926).

Perithecia have not been observed in Trinidad. Among the many synonyms of this fungus the following should probably be included:

Botryodiplodia theobromae Pat. in *Bull. Soc. mycol. Fr.*, viii, p. 136, 1892.

Diplodia natalensis Pole Evans in *Sci. Bull. Dep. Agric. Transvaal*, iv, p. 15, 1910.

On cacao pod, La Vega, 28.i.1921, E. M. Wakefield 361 in Herb. R.B.G. Kew.

In Trinidad this species is a common saprophyte and weak parasite of many plants. It is associated with dieback in cacao and citrus and causes fruit rots of citrus, cacao, papaw, avocado pear, mango, &c.

Physalospora rhynchosporae Baker & Chardon, sp. nov.

Perithecia in maculis decoloratis culmicolis foliicolisque immersa, in lineas parallelas longitudinales disposita, globosa vel subglobosa, 150–200 μ diam. per superficiem collo breve ut punctum nigrum visible erumpentia. *Asci* cylindracei, breviter stipitati, unifermiter tenuiterque tunicati, 100–125 $\times$ 10–13 μ. *Ascosporae* 8, biseriatae vel inordinatae, unicellulares, hyalinae, guttulatae, falcatae, tenuiter tunicatae praeditae, 30–34 $\times$ 5–6 μ. *Paraphyses* filiformes.

Hab. in caulibus foliisque *Rhynchosporae corymbosae*, Piarco, Trinidad, 3.viii.1947, Baker I.C.T.A. 1523 (typus).

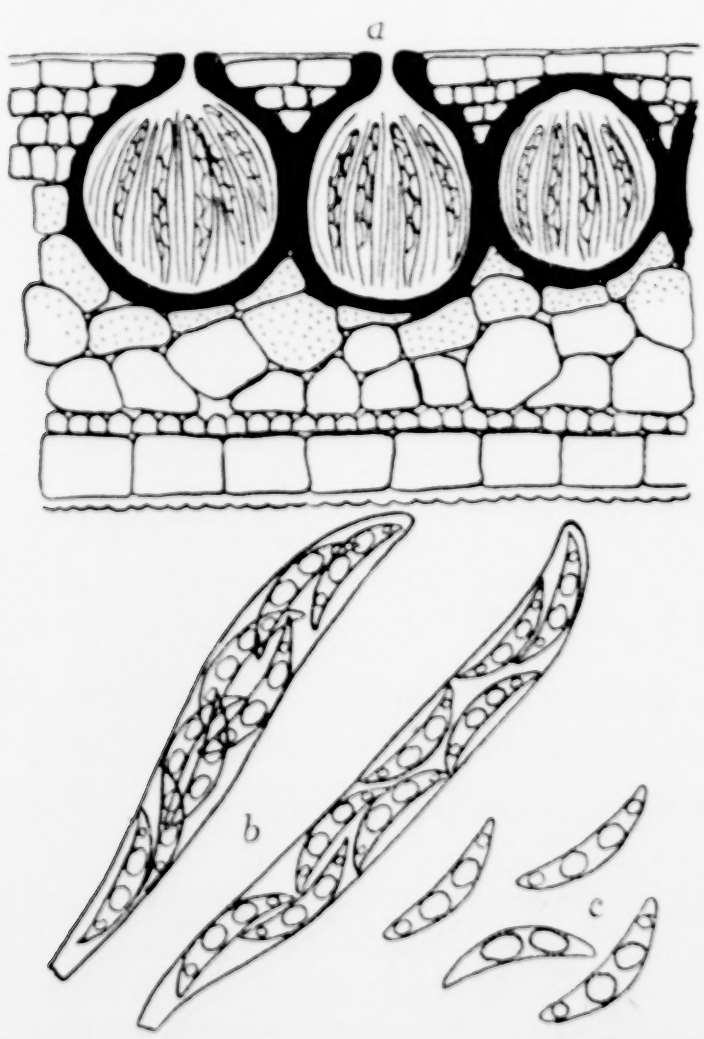


FIG. 9. *Physalospora rhynchosporae*. (a) perithecia $\times$125; (b) asci $\times$500; (c) ascospores $\times$500.

appear to be much justification for attempting to make more than one species out of these specimens. Spermatia were observed in I.C.T.A. 858 from Grenada.

Phyllachora sphaerosperma Wint. in *Hedwigia*, xxiii, p. 170, 1884.

Phyllachora sphaerospora Pat. in *Bull. Soc. mycol. Fr.*, iii, p. 126, 1887.

On *Cenchrus echinatus*, Teteron bay, 20.xii.1944, C. E. Chardon, Fungi of Trinidad, No. 46; Chacachacare, 10.ii.1946, I.C.T.A. 956.

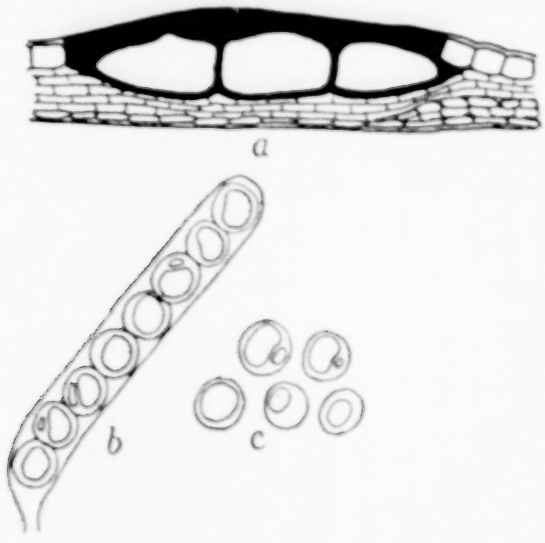


FIG. 14. *Phyllachora sphaerosperma*. (a) perithecia; (b) ascus ×500; (c) ascospores ×500.

Phyllachora taruma Speg. in *An. Soc. cient. Argent.*, xix, p. 94, 1886.

On *Vitex capitata*, Caura valley, 17.ii.1945, I.C.T.A. 455; 19.ii.1945, I.C.T.A. 467; Arena forest, 16.iv.1947, I.C.T.A. 1427.

On *Vitex divaricata*, Arena forest, 4.iv.1947, I.C.T.A. 1428; Diego Martin, 27.v.1947, I.C.T.A. 1445.

I.C.T.A. 1445, collected towards the end of a severe dry season, is mainly spermatial. The spermatia (20×0·2–0·5 μ) are in locules similar to the perithecia.

Phyllachora tragiae (Berk. & Curt.) Sacc., Syll. Fung., ii, p. 601, 1883.

Dothidea tragiae Berk. & Curt., F. exot. Schw., p. 288.

On *Croton trinitatis*, Erin, 16.ix.1945, I.C.T.A. 719; Mausica savannah, 4.xii.1947, I.C.T.A. 1789.

Distinguished from *Phyllachora crotonis* (I.C.T.A. 1110) by the mainly unilocular sporangia and the smaller, ellipsoid, uniseriate ascospores measuring 10–13×6–7 μ in our material.

Phyllachora venezuelensis Syd. in *Ann. mycol., Berl.*, xxviii, p. 107, 1930.

Catacauma venezuelensis (Syd.) Chardon in *J. Dept. Agric. P.R.*, xvi, p. 170, 1932.

On *Machaerium robinifolium*, Gasparee Is., 2.i.1946, I.C.T.A. 780; Chacachacare Is., 10.ii.1946, I.C.T.A. 968.

On *Machaerium tobagense*, Long Stretch forest, 11.v.1945, I.C.T.A. 552; Mt. St. Benedict, 16.ii.1947, I.C.T.A. 1095.

Distinguished from *Phyllachora machaeriicola* by the scattered, plurilocular, epiphyllous stromata, which are formed in the epidermal cells. The ascospores are biseriate, nearly globose, 12–15×11–13 μ.

831

Sphaerodothis acrocomiae Chardon & Baker, sp. nov.

Stromata amphigena, praecipice epiphylla, in epidermide immersa, dispersa, vel in lineas parallelas disposita, proeminentia, atra, nitida, multilocularia, ellipsoidea, 1–3×1–1·5 mm. *Asci* breve stipitati, cylindracei, 100–150×15–18 μ. *Ascosporae* atro-brunneae, unicellulares, ellipsoideae vel fusiformes, uniseriatae, laeves, 17–19×8–9 μ pariete 1–1·5 μ crasso praeditae. *Paraphyses* filiformes. *Spermatis* in loculis peritheciis similibus, filiformes 15–20×0·5 μ.

Hab. in foliis *Acrocomiae ierensis*, Diego Martin, Trinidad, 7.iv.1947, Baker, I.C.T.A. 1424 (typus); St. Augustine, 20.vi.1947, I.C.T.A. 1471.

FIG. 15. *Sphaerodothis acrocomiae*. (a) perithecia; (b) ascus ×500; (c) ascospores ×500.

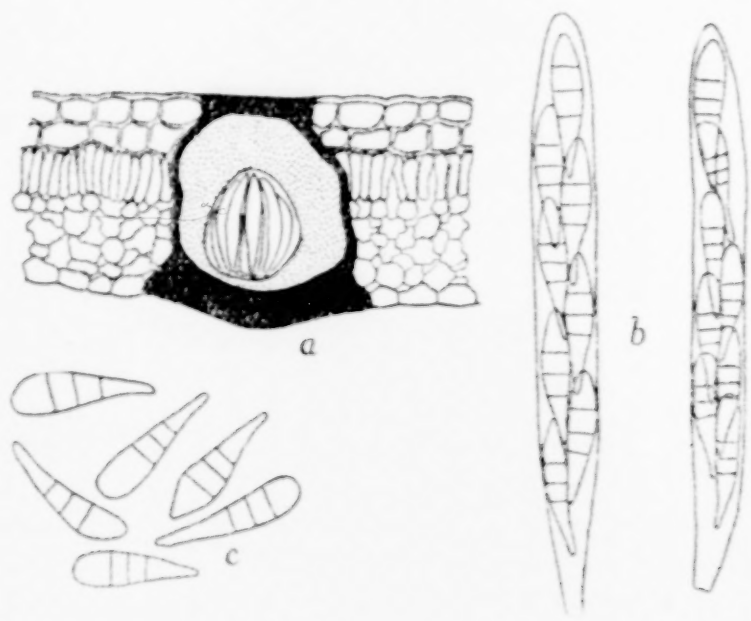


FIG. 16. *Metasphaeria phyllachoracearum*. (a) perithecium inside old *Phyllachora* stroma; (b) asci ×500; (c) ascospores ×500.

HYPERPARASITES OF PHYLLACHORACEAE

Cryptodidymosphaeria clandestina Syd. in *Ann. mycol., Berl.*, xxxvii, p. 196, 1939.

On *Phyllachora paspalicola* on *Paspalum conjugatum*, Mt. Dillon, Tobago, 26.viii.1947, I.C.T.A. 1572.

The perithecia are found inside old *Phyllachora* locules, the ascospores being two-celled, brown, 14–16×4 μ. First collected in 1935 by F. C. Deighton in Sierra Leone and not previously recorded from the Western Hemisphere.

Metasphaeria phyllachoracearum Petrak in *Ann. mycol., Berl.*, xxix, p. 349, 1931.

A member of the Sphaeriales, which occurs rather commonly in old *Phyllachora* stromata, has been recorded on the following specimens: Piarco, 10.i.1945, *Phyllachora oxyspora* on ? *Imperata brasiliensis*, I.C.T.A. 396; St. Augustine, 29.xi.1944, *Phyllachora* sp. on *Paspalum pumilum*, I.C.T.A. 299; Maracas valley, 7.ii.1945, *Phyllachora* sp. on *Paspalum pilosum*, I.C.T.A. 449; Pitch lake, 15.ix.1945, *Phyllachora* sp. on *Paspalum pilosum*, I.C.T.A. 697; Arena forest, 21.ii.1945, *Phyllachora* sp. on unknown host, I.C.T.A. 488.

The perithecia occur several together inside the locules of old *Phyllachora* stromata; the ascospores are biseriate, hyaline, unequally four-celled,

straight or somewhat curved, pointed below and rounded above. We are indebted to Dr. C. E. Chardon for the determination of this species.

Capnodiaceae

[**Capnodium mangiferum** Cooke & Broome in *Grevillea*, iv, p. 117, 1876.
On Mango (*Mangifera indica*) K. Bancroft, Handbook of Fungus Diseases of West Indian Plants, p. 19, 1910.]

MICROTHYRIALES

Stigmateaceae

Munkiella mascagniae Starb. in *Bih. svensk. VetenskAkad. Handl.*, xxv, 3, no. 1, p. 46, 1902.
On *Mascagnia sepium* subsp. *bierosa*, Arena forest, 21.ii.1945, I.C.T.A. 476; Maracas bay, 18.ii.1945, I.C.T.A. 464; 8.xii.1946, I.C.T.A. 1012; 3.iii.1947, I.C.T.A. 1367; 11.v.1947, I.C.T.A. 1433.

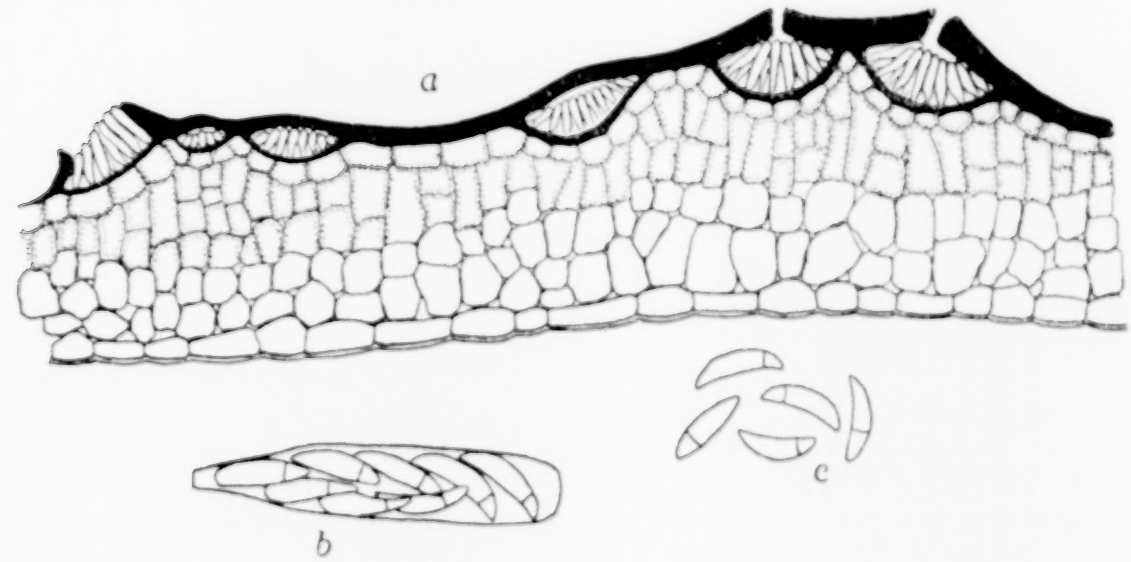


FIG. 17. *Munkiella mascagniae*. (a) thyriothecia; (b) ascus ×500; (c) ascospores ×500.

Microthyriaceae

Rhagadolobium cucurbitacearum (Rehm) Theiss. & Syd. in *Ann. mycol., Berl.*, xii, p. 275, 1914.
Dothidella cucurbitacearum Rehm in *Hedwigia*, xxxvi, p. 376, 1897.
On *Cucurbita pepo*, Diego Martin, 2.x.1944, I.C.T.A. 205; Santa Cruz, 7.xii.1944, C. E. Chardon, Fungi of Trinidad, No. 12; A. K. Briant, St. Augustine, 1932, in I.C.T.A. Museum.

Asterinaceae

Asterina caricarum Rehm in *Hedwigia*, xxxiv, p. 161, 1895, var. **microspora** Theiss., Gatt. Asterina, p. 96, 1913.
On *Carica papaya*, St. Joseph, 29.xi.1944, I.C.T.A. 305; Sangre Grande, 9.iii.1947, I.C.T.A. 1348.

Asterina centropogonis Baker & Dale, sp. nov.
Plagulae plerumque epiphyllae, numerosae, tenues, ad 7 mm. diam. vel confluendo majores. *Mycelium* ex hyphis atrobrunneis, sinuosis, prope 5 μ crassis, acute-ramosis (cellulis 13–44 μ longis) compositum. *Hyphopodia* alternata, antrorsa, cellula basali 2–5 μ longa, cellula apicali 2–4 lobata, ad 15 μ longa, 10 μ lata. *Thyriothecia* centro plagulae dense aggregata,

832

peripheriam versus dispersa, 120–150 μ diam., fissuris radiantibus aperta, membrana basali tenui, incompleta, sub-hyalina praedita. *Asci* elliptici vel globosi, modice numerosi (5 ad 10), 30–60 × 30–50 μ. *Ascosporae* conglobatae, 1-septatae, constrictae, brunneae, verrucosae, utrinque rotundatae, cellula apicali modici majore, globosa, cellula basali ellipsoidea, 19–25 × 9–14 μ.

Hab. in foliis *Centropogonis cornuti*, Arima–Blanchisseuse rd., Trinidad, 20.iv.1947, Baker, I.C.T.A. 1420 (typus).

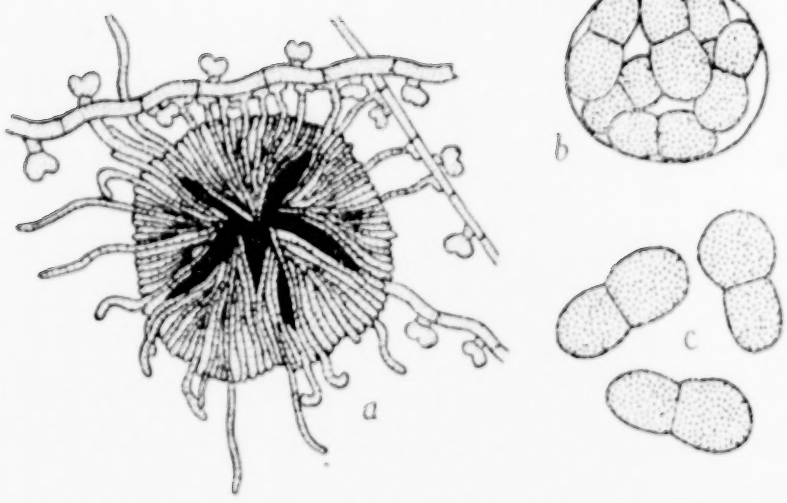


FIG. 18. *Asterina centropogonis*. (a) thyriothecium; (b) ascus × 500; (c) ascospores × 500.

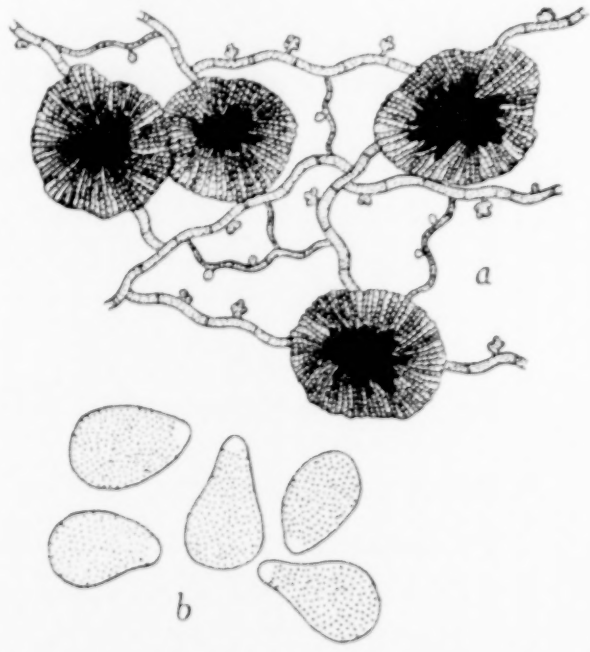


FIG. 19. *Asterina coriacella*. (a) pycnidia; (b) pycnospores × 500.

On the same host, E. M. Wakefield 332 in Herb. R.B.G. Kew (I.M.I. 25813), Morne Bleu, 2.i.1921; E. M. Wakefield 206 in Herb. R.B.G. Kew (I.M.I. 25810a), La Seiva valley, 16.i.1921; Maracas valley, 4.x.1944, I.C.T.A. 230; Tabaquite forest, 9.iii.1947, I.C.T.A. 1349; Arima–Blanchisseuse rd., 17.viii.1947, I.C.T.A. 1546.

Asterina chrysophylli P. Henn. in *Hedwigia*, xlviii, p. 12, 1908.

On *Miconia acinodendron*, Talparo, 25.i.1948, I.C.T.A. 1860.

Asterina coriacella Speg. in *Bol. Acad. nac. cient. Cordoba*, xi, p. 560, 1889.

On *Cestrum latifolium*, Piarco, 1.iii.1947, I.C.T.A. 1325; Tabaquite forest, 9.iii.1947, I.C.T.A. 1362; Arena forest, 4.iv.1947, I.C.T.A. 1395; Cap de Ville, 29.ii.1948, I.C.T.A. 1903.

Asterina costaricensis Syd. in *Ann. mycol., Berl.*, xxv, p. 51, 1927.

On *Justicia secunda*, St. Augustine, 4.xii.1944, I.C.T.A. 325; 18.ii.1947, I.C.T.A. 1117; Arena forest, 4.iv.1947, I.C.T.A. 1398; Heights of Aripo, 24.xii.1947, I.C.T.A. 1796.

Asterina cubensis Sacc. & Syd., Syll. Fung., xiv, p. 698, 1899.

On *Passiflora rubra*, Mt. St. Benedict, 15.xii.1945, I.C.T.A. 759; 16.ii.1947, I.C.T.A. 1101.

Specimens of *Asterina* have also been collected on *Passiflora foetida* and *Passiflora serrato-digitata*, but these have pycnidia and are probably distinct from *A. cubensis*.

HYPERPARASITES OF ASTERINA.

(1) ASCOMYCETES

Phaeodimeriella appendiculata (Earle) Baker, comb. nov.

Dimerosporium appendiculatum Earle in *Bull. N.Y. bot. Gdn.*, p. 303, 1904.

On *Asterina costaricensis* on *Justicia secunda*, St. Augustine, 18.ii.1947, I.C.T.A. 1117 (b); Mt. Aripo, 24.xii.1947, I.C.T.A. 1796.

On *Asterina diplocarpa* on *Sida stipulata*, E. M. Wakefield 147, 20.i.1921, in Herb. R.B.G. Kew.

On *Peltaster* sp. on *Borreria laevis*, Arena forest, 16.iv.1947, I.C.T.A. 1421.

Our collections assigned to this species differ from authentic material of *Phaeodimeriella guarapiense* (Speg.) Speg. (Balansa 3848 from Paraguay in Herb. R.B.G. Kew; slide in Herb. I.M.I. 5878) in the smaller perithecia, asci, and ascospores. Our specimens agree with the type collection of *Dimerosporium appendiculatum* Earle (Heller 6333 from Puerto Rico on *Asterina sidae* Earle [*Asterina diplocarpa* Cooke] on *Sida carpinifolia* [= *Sida stipulata* Cav. fide N.Y. Sandwith] in Herb. R.B.G. Kew; slide in Herb. I.M.I. 5879a). For figure, see p. 43.

Phaeodimeriella guarapiense (Speg.) Speg. in *Rev. Mus. La Plata*, xv, p. 15, 1908.

On *Asterina coriacella* on *Cestrum latifolium*, Tabaquite forest, 9.iii.1947, I.C.T.A. 1362.

Phaeodimeriella trinitensis Baker & Dale, sp. nov.

≡ *Asterina solanicola* Berk. & Curt. p.p. in *J. Linn. Soc., Bot.*, x, p. 374, 1869 (non *Asterina solanicola* P. Henn.).

≡ *Dimerosporium solanicola* (Berk. & Curt.) Speg. [as *D. solanicolum*] in *An. Soc. cient. Argent.*, xxvi, p. 16, 1888.

≡ *Dimeriella solanicola* (Berk. & Curt.) Speg. [presumed comb. nov.] in *Rev. Mus. La Plata*, xv, p. 12, 1908.

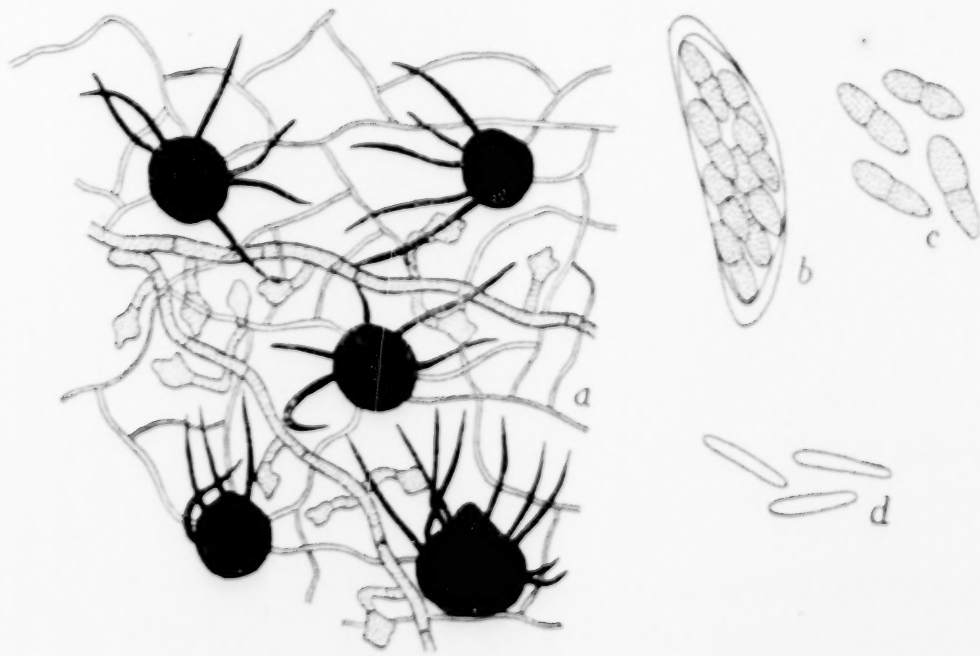


FIG. 23. *Phaeodimeriella trinitensis*.
(a) perithecia; (b) ascus ×500;
(c) ascospores ×500; (d) pycnospores ×500.

833

Mycelium in plagulis *Asterina* parasitans, ex hyphis dilute olivaceis vel subhyalinis, dense vel laxe reticulatis, ramosis, indistincte septatis, 2–3·5 μ cr. compositum, interdum subpelliculosum, hyphopodiis setisque carens. *Perithecia* superficialia globosa dispersa, atro-brunnea, membranacea, 70–150 μ diam., setis dispersis, 2–8, pallidioribus, rectis vel flexuosis, continuis, e basi ad apicem simplicem, obtusum vel subacutum, pallidiorem attenuatis 70–150 μ longis, ornata. *Asci* clavato-cylindrica vel obclavati superne rotundati, crasse-tunicati, inferne breviter nodoso-stipitati, 8-spori, 40–55 × 12–15 μ. *Paraphyses* in peritheciis juvenilibus praesentes, 2 μ lati, nonnihil ascis superantes. *Ascosporae* 1- vel 2-seriatae, ovatae, primo hyalinae, dein brunneae, utrinque rotundatae, constrictae, leves, 12–16 × 4–5 μ; cellulas superiore nonnihil breviore latioreque. *Pycnidia* perithecia simulantia. *Pycnosporae* elongato-ellipsoideae, pallide brunneae, leves, continuae, apice rotundato, basi aliquanto truncatae, 11–15 × 2 μ.

In plagulis *Asterinae diplopodae* in foliis *Solani* sp., Mt. Aripo, Trinidad, 24.xii.1947 (I.C.T.A. 1797 (b), Baker, typus), in Herb. I.C.T.A. et Herb. I.M.I. preservatus.

Berkeley & Curtis (1869) cited a single specimen which is preserved in Herb. R.B.G. Kew and labelled by Berkeley as follows: '560. *Asterina solanicola*, B. & C. Cuba Wright & Curtis in *Solanum* Feb.' This is the type collection of *Asterina solanicola* Berk. & Curt. [Slide in Herb. I.M.I. No. 19469 (a).] The specimen bears colonies of *Asterina* which are heavily parasitized by a *Phaeodimeriella* and considering the original diagnosis there is no doubt that it was based upon the two fungi. Spegazzini (1888) drew attention to this fact and redescribed the hyperparasite under the name '*Dimerosporium solanicolum* (Bk. & C.) Speg.'. Theissen (1913), however, used the name *Asterina solanicola* Berk. & Curt. for the *Asterina*, thereby excluding the hyperparasite which figured so largely in the original diagnosis by Berkeley & Curtis.

In view of the confusion we propose to reject the name *Asterina solanicola* Berk. & Curt. as a *nomen confusum*, based, as it was, on two distinct species.

A recent Trinidad collection of the hyperparasite is here described as new instead of following Spegazzini in taking up the Berkeley & Curtis epithet.

(2) HYPHOMYCETES

Domingoella asterinarum Petr. & Cif. in *Ann. mycol., Berl.*, xxx, p. 339, 1932.

On *Asterina centropogonis* on *Centropogon cornutus*, Tabaquite forest, 9.iii.1947, I.C.T.A. 1349; Heights of Aripo, 24.xii.1947, I.C.T.A. 1800 b; La Seiva valley, 16.i.1921, E. M. Wakefield in Herb. R.B.G. Kew (I.M.I. 25810 b).

On *Asterina* sp. on *Passiflora serrato-digitata*, Maracas bay, 14.iii.1948, I.C.T.A. 1909 b.

Stereum ravenelii Berk. & Curt. in *Grevillea*, i, p. 162, 1873.
M. A. Carriker, Carengo; St. Augustine, 20.vi.1939, I.C.T.A. 51.

Stereum surinamense Lév. in *Ann. Sci. nat., Bot.*, Sér. 3, ii, p. 209, 1844.
On dead wood, Thaxter, 1913; from cacao plantations and forests, Maracas valley and elsewhere, 28.xi.1938, Rayner, I.C.T.A. 5 and 5a.

[Stereum umbrinum Berk. & Curt. in *Grevillea*, i, p. 164, 1873.
H. R. Briton-Jones, 1926.]

Stereum vibrans Berk. & Curt. in *J. Linn. Soc., Bot.*, x, p. 332, 1868.
In 1911 list, sub *Hymenochaete vibrans*, in Herb. R.B.G. Kew.

Hydnaceae

Hydnum bambusinum Baker & Dale, sp. nov. (Plate IIa).

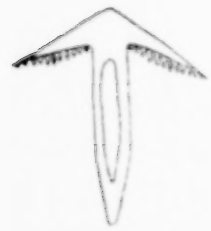


FIG. 24. *Hydnum bambusinum.*

Pileus late conicus, umbonatus, 2–4 cm. diam., fusco-griseus, nitidus, sericeus, zona atra angustissima 1–2 mm. a margine remota praeditus. *Contextus* pallide umbrinus (wood-brown R.), centro crassus, marginem versus tenuior. *Stipes* centralis, albo-griseus, 2–3·5 cm. longus, 3–6 mm. crassus, fistulosus, basim versus angustatus. *Acueli* ex albidi pallide umbrini. *Basidia* clavata, 25–30×7–10 μ; sterigmata 4, 6–7 μ longis. *Sporae* subglobosae, olivaceo-fuscae, crasse tuberculatae, 6·5–7(9)×5–7 μ.

Solitarius, ad terram inter bambusis, rarus. Bamboo plantation, St. Joseph, Trinidad, 10.xii.1947, I.C.T.A. 1847 (typus) in Herb. R.B.G. Kew.

Odontia sacchari Bürt in *Ann. Mo. bot. Gdn.*, iv, p. 233, 1917.
On sugar-cane.

Odontia saccharicola Burt in *Ann. Mo. bot. Gdn.*, iv, p. 235, 1917.
On sugar-cane.

For a discussion of the two species of *Odontia* in relation to root diseases of sugar-cane in Trinidad, see R. O. Williams, *Mem. Dept. Agric. Trin. Tob.*, i, p. 94, 1921. Only the imperfect stages have been seen in Trinidad.

Polyporaceae

Amauroderma brittonii Murr. in *Mycologia*, ii, p. 193, 1910.
At root of *Tabebuia pentaphylla*, St. Augustine, 11.ix.1947, I.C.T.A. 1677, and in Herb. R.B.G. Kew.

Possibly the same as *Polyporus talpae* Cooke, but not *Polyporus meso-talpae* (fide E. M. Wakefield).

Amauroderma ocellatum (Berk.) Lloyd, Syn. Stip. Polyp., p. 118, 1912.
Fomes ocellatus Berk. in *Hooker's J. Bot.*, x, p. 172, 1856.
On wood, Botanic Gardens, Rayner, 1941, in Herb. I.C.T.A.

Amauroderma schomburgkii (Mont. & Berk.) Lloyd, Syn. Stip. Polyp., p. 118, 1912.
On the ground, Long Stretch forest, Broadway 6764, 10.ii.1928, in Herb. R.B.G. Kew.

834

Bresadolia paradoxa Speg., Fung. Guar. Pug., i, p. 15, 1883.

On a log, La Vega, 28.i.1921, E. M. Wakefield 338 in Herb. R.B.G. Kew.

Said by Bresadola (*Ann. mycol., Berl.*, xiv, p. 222, 1916) to be an abnormal form of *Polyporus squamosus*. Spores cylindrical, guttulate, 11–14 × 4–4·5 μ.

[**Favolaschia sabalensis** (Charles) Singer in *Lloydia*, viii, p. 207, 1945.

Thaxter, April (1913?) on leaves and petioles of *Sabal palmetto*.]

Favolaschia sp.

A minute Polypore occurring on the dead sheaths of bamboo stems identified incorrectly by Rayner in 1941, I.C.T.A. 19, as *Porodisculus pendulus* (Schw.) Murr. The specimen in Herb. R.B.G. Kew is sterile.

Favolus brasiliensis Fr., Elench. Fung., i, p. 44, 1828.

In 1911 list; on dead wood, Mt. Aripo, 18.vi.1947, I.C.T.A. 1463, and in Herb. R.B.G. Kew.

Favolus subcaperatus (Murr.) Sacc. & Trav., Syll. Fung., xxi, p. 355, 1912.

Hexagona subcaperata Murr. in *N. Amer. Flora*, ix, p. 50, 1907.

Rayner, 7.xii.1938, Southern Range Reserve and in Northern Range above Matelot, I.C.T.A. 28.

Favolus tessellatulus (Murr.) Sacc., Syll. Fung., xvii, p. 142, 1905.

Hexagona tessellatula Murr. in *Bull. Torrey bot. Cl.*, xxxi, p. 330, 1904.

On wood, Broadway 3221, det. Bresadola (*Ann. mycol., Berl.*, ix, p. 553, 1911); on dead wood, Nonpareil estate, Rayner, 14.xii.1938, I.C.T.A. 29.

Favolus tessellatus Mont. in *Ann. Sci. nat.*, Sér. 2, xx, p. 365, 1843.

River Estate, 11.i.1921, E. M. Wakefield 115 in Herb. R.B.G. Kew.

Fomes calcitratus Berk. & Curt. in *J. Linn. Soc., Bot.*, x, p. 314.

H. R. Briton-Jones, 1926, in Herb. R.B.G. Kew.

[**Fomes endotheius** (Berk.) Cooke in *Grevillea*, xiv, No. 69, p. 19, 1885.

F. J. Seaver, 1922, a doubtful record; the type collection is from the Philippine Is. and there is no collection in the Herb. R.B.G. Kew, from the New World.]

Fomes extensus Lév. in *Ann. Sci. nat.*, iii, p. 111, 1846.

Pyropolyporus extensus (Lév.) Murr. in *N. Amer. Flora*, ix, p. 110, 1908.

On dead dicotyledonous tree-stump, Southern Watershed Reserve, Rayner, 1941, in Herb. I.C.T.A.

[**Fomes geotropus** Cooke in *Grevillea*, xiii, p. 32, 1884.

Britton *et al.* 1920.]

[**Fomes lignosus** (Kl.) Bres. in *Hedwigia*, liii, p. 60, 1912.

Briton-Jones 1926, on dead wood of *Erythrina*, *Castilloa*, and *Theobroma*.

See notes by Rayner (loc. cit.) who considers this record to be an error for *F. microporus* which it closely resembles.]

[**Fomes marmoratus** (Berk. & Curt.) Cooke in *Grevillea*, xiv, No. 69, p. 18, 1885.

On dead mango (*Mangifera indica*) log, H. R. Briton-Jones, 1926.]

Agaricus trinitatensis Baker & Dale, sp. nov.

Pileus 6–11 cm. diam., carnosus, primo hemisphaericus, dein applanatus umbonatusque, interdum margine fisso, albidus, squamis numerosis, brunneis, fibrillosis ornatus. *Stipes* robustus, 5–8 cm. longus, 1–2 cm. crassus,

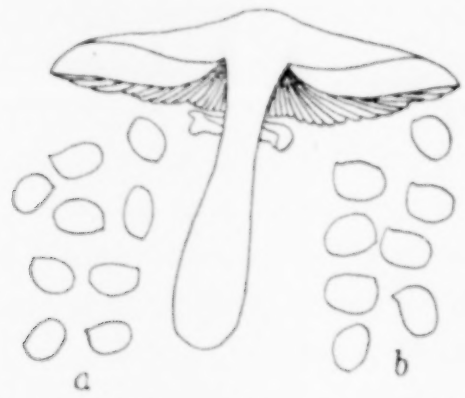


Fig. 26. *Agaricus trinitatensis*. (a) spores ×750; (b) spores of *Agaricus hornei* ×750.

supra leviter attenuatus, basi sub-bulbosa, subterranea, fistulosus, cremeus, aetate brunnescens, sub annulo fibrillosus. *Annulus* superus, albidus, latus, crassus, persistens. *Contextus* albus, in stipite vulnerato leviter flavescens. *Lamellae* ex albido-roseis, purpureo-umbrinae, denique atrae, liberae, confertae, ad 8 mm. latae. *Sporae* pallide purpureo-umbrinae, ellipticae, 5·5–7·5×3·5–4 μ, in masso atropurpureae. Fig. 26. Plate IIIa.

Esculentus, odor et sapor gratus; solitarius, vel interdum caespitosus. Ad terram in hortis.

St. Augustine, Trinidad, 12.v.1947, Baker, I.C.T.A. 1430 (typus) in Herb. R.B.G. Kew; same locality 19.v.1947, I.C.T.A. 1435 and 28.v.1947, I.C.T.A. 1440 in Herb. R.B.G. Kew.

Very like *A. hornei* Murr. in appearance, but distinguished by the smaller narrower spores.

Agaricus violaceo-squamulosus Baker & Dale sp. nov.

Pileus 3·5–4 cm. diam., primo hemisphaericus, dein late campanulatus, pallide malvaceus, squamis numerosis, fusco-purpureis, recurvatis ornatus. *Stipes* 3–4·5 cm. longus, 4–7 mm. crassus, supra leviter attenuatus, super annulo cremeus, sub annulo malvaceus squamosusque. Annulus latus, persistens, infra albidus, supra brunnescens. *Contextus* albus, centro crassus, marginem versus tenuior. *Lamellae* liberae, confertae, brunneae, angustissimae, 1–1·5 mm. latae. *Sporae* pallidissime purpureo-umbrinae, ellipticae, 5–6×3–4 μ, in masso atro-purpureo. Fig. 27. Plate Ic.

Fig. 27. *Agaricus violaceo-squamulosus*. (a) spores ×500.

Solitarius ad terram sub arboribus.

St. Augustine, Trinidad, 26.vi.1947, Baker, I.C.T.A. 1475 (typus) in Herb. R.B.G. Kew.

A. venus Murr. from Cuba has somewhat similar colouring and spores but is much larger, stouter, and less scaly. *A. vinaceo-umbrinus* Smith from Texas is similar in size and perhaps in colour, but is not scaly and gives a characteristic colour reaction in potassium hydroxide, in which our specimen shows no colour change.

835

Agaricus xanthodermus Genev. in *Bull. Soc. bot. Fr.*, xxiii, p. 32, 1876.

Pileus convex, up to 8 cm. diam., light grey with darker fibrils, dry. *Stipe* cylindrical, dingy white, hollow, with a persistent ring near the apex. *Flesh* white, grey under the cuticle of the pileus, staining deep yellow in the stipe when bruised or cut. *Gills* remote from the stipe, crowded, pale purplish-brown. *Spores* light grey-brown, elliptical, 5–6 × 3–3·5 μ, dark brown in mass. Fig. 28. Plate IVa.

A. xanthodermus is a well-known north temperate species which occurs in several colour forms. Our fungus may provisionally be referred to it.

FIG. 28. *Agaricus xanthodermus* (a) spores × 500.

On the ground under trees, St. Augustine, 26.vi.1947, I.C.T.A. 1474.

Chlorophyllum molybdites (Meyer ex Fr.) Massee in *Kew Bull.*, p. 136, 1898.

In groups in pastures, St. Augustine, 1.viii.1947, I.C.T.A. 1486. A striking species up to 8 in. in diameter, resembling a large *Lepiota*, but with green gills and bright green spores when fresh. (For a figure see Morgan in *J. Cincinnati Soc. nat. Hist.*, vi, pl. 2, 1883, as L. *morgani* (Peck) Sacc.)

[**Clitocybe illudens** (Schw.) Sacc., Syll. Fung., v, p. 162, 1887.

Rayner in 1941 observed several species growing on wood in the wet season and recorded *Clitocybe illudens* Sacc. as a bright yellow densely gregarious species found on an old bamboo stump in the Bamboo Plantation, St. Joseph.]

Clitocybe microspora Baker & Dale sp. nov.

Pileus 2–3 cm. diam., pallide flavo-cremeus, profunde infundibuliformis, laevis, siccus, margine primo involuto, aliquando fisso. *Stipes* 3–4 cm. longus, 2–3 mm. latus tenuis, solidus, flexuosus, supra leviter attenuatus, flavo-cremeus. *Lamellae* longe decurrentes, cremeae, confertae, acutae, ad 2 mm. latae. *Sporae* minutae, subglobosae, 2·5–3 × 2 μ. Fig. 29. Plate IIc.

Solitarius ad terram inter bambusas.

Bamboo plantation, St. Joseph, Trinidad, 2.ix.1947, Baker, I.C.T.A. 1558 (typus) in Herb. R.B.G. Kew.

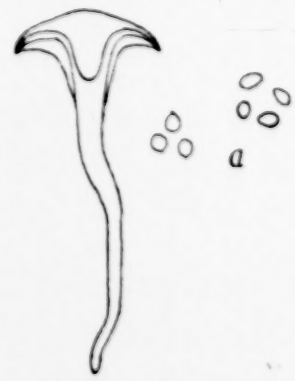


FIG. 29. *Clitocybe microspora*. (a) spores × 500.

Collybia cf. **luxurians** Peck in *Bull. Torrey bot. Cl.*, xxiv, p. 141, 1897.

On rotting palm trunk, St. Augustine, 3.viii.1947, I.C.T.A. 1491.

Coprinus mexicanus Murr. in *Mycologia*, x, p. 84, 1918.

On logs, caespitose, River Estate, 11.i.1921, E. M. Wakefield 111; La Victoria, Four Roads, 18.i.1921, E. M. Wakefield, in Herb. R.B.G. Kew.

Coprinus spp.

Several species, both coprophilous and terrestrial, occur commonly but, owing

Marasmius perniciosus Stahel in *Bull. Dept. Landbouw Suriname*, 33, p. 16, 1915.

On *Theobroma cacao*, causing 'witches' broom disease', I.C.T.A. 84 and 95. The small pinkish fructifications, up to about 1·5 cm. in diameter, develop abundantly on the dead witches' brooms in wet weather. For an account of this disease see Baker & Crowdy, Imperial College of Tropical Agriculture, Mycological Memoirs No. 7 and No. 8.

[**Marasmius sacchari** Walker in *Centr. Bakt. Parasit. Infekt.*, ii, p. 44, 1896.

On sugar-cane, 1911 list. One of the causes of 'root disease' of sugar-cane.]

Marasmius sordidus Massee in *Kew Bull.*, p. 249, 1910.

On dead twigs, 1911 list; Arena forest, 2.viii.1947, I.C.T.A. 1489.

Marasmius stenophyllus Mont., *Ann. Sci. nat.*, Sér. 4, i, p. 116, 1854.

Marasmius semiustus Berk. & Curt. in *J. Linn. Soc., Bot.*, x, p. 295, 1868, fide Murrill.

On bananas, 1911 list, det. at Kew; on bananas, St. Augustine, I.C.T.A. 48. A small, white *Marasmius*, presumably this species, occurs commonly on damp banana trash.

Marasmius tageticolor Berk. in *Hooker's Kew J. Bot.*, viii, p. 136, 1856.

Pileus campanulate, up to 2 cm. diam., purple, very thin, sulcate-striate, surface covered with cellules-en-brosse. *Stipe* light grey-brown, darker below, wiry, arising from a small white hyphal disk. *Gills* few, distant about 2 mm., lilac. *Spores* hyaline, fusiform, often 1-guttulate, 19–21 × 3 μ. Plate IIIb.

Common on dead leaves, Arena forest, 2.viii.1947, I.C.T.A. 1488. Rayner, 1941, I.C.T.A. 43 and I.C.T.A. 71, described a common little purple *Marasmius* found on dead leaves in cacao plantations as *M. atropurpureus* Murr. This is possibly the same species.

Naucoria sp.

A common yellowish-brown species about 2–3 cm. in diam. occurs on lawns and savannahs after heavy rain. It has been incorrectly identified in the past with *Naucoria semiorbicularis* (Bull.) Quel. or *N. pediades* (Fr.) Quel., and its correct systematic position is still uncertain.

Nolanea fragilis Baker & Dale sp. nov.

Pileus 2·5–3 cm. diam. campanulatus subumbilicatusque, fragilis, laevis, sericeus, pallide roseus, margine orenato. *Stipes* 3–4 cm. longus, 2–3 mm. crassus, pallide roseus, gracilis, fragilis, fistulosus, supra leviter attenuatus. *Contextus* tenuissimus, albido-roseus. *Lamellae* roseae, liberae, confertae, angustissimae, 1–1·5 mm. latae. *Sporae* roseae in masso, elongatae, 6–7 angulatae, guttula magna centrali et apiculo praeditae; 9–10 (ad 12 cum apiculo) × 6–7 μ. Fig. 36. Plate IIb.

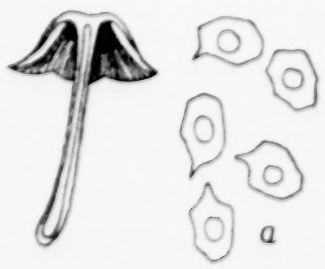


FIG. 36. *Nolanea fragilis*. (a) spores × 500.

Solitarius ad terram in bambusis, Bamboo Plantation, St. Joseph, Trinidad, 9.viii.1947, I.C.T.A. 1499 (typus) in Herb. R.B.G. Kew.

Somewhat resembles *Rhodophyllus truncatus* Romagnesi, which has

836

adnate gills, and *R. subglaber* Romagnesi, which has much broader gills, both from Madagascar.

Nolanea howellii Peck in *Bull. N.Y. State Mus.*, cl, p. 59, 1911.

Pileus convex with a prominent obtuse umbo, dry, silky, about 3 cm. diam., dusky violet blue (Ridgway). *Stipe* cylindrical with a slightly bulbous base, cream below, clothed with dusky violet-blue fibrils above, solid. *Gills* adnate, cartridge-buff (Ridgway), rather broad, 4–5 mm. *Flesh* thin, cartridge-buff. *Spores* 5–6 angled, often with a large central guttule and a large apiculus, 10–12 × 6–8 μ. *Basidia* large, clavate, (?) 2-spored. Fig. 37. Plate IIg.

On the ground among bamboo leaves, Bamboo Plantation, St. Joseph, 10.xii.1947, I.C.T.A. 1851.

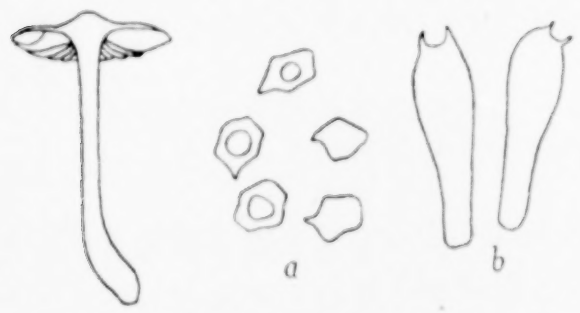


FIG. 37. *Nolanea howellii*. (a) spores × 500; (b) cystidia × 500.

FIG. 38. *Omphalia bicolor*. (a) spores × 500.

Omphalia bicolor Baker & Dale sp. nov.

Pileus 2–3 cm. diam., ferrugineus (R.), applanatus, dein depressus umbonatusque, siccus, fibrillosus, interdum margine fisso. *Stipes* 3–4 cm. longus, 2–4 mm. crassus, albus, cylindraceus, tenuis, laevis, solidus, interdum curvatus. *Contextus* albus, tenuis. *Lamellae* albae, subdistantes, decurrentes, postice rotundatae, ad 2 mm. latae. *Sporae* subglobosae, albae, 4–5 × 3·5–4 μ, apiculo conspicuo praeditae. Fig. 38. Plate IIf.

Solitarius, ad truncos bambusarum, Bamboo Plantation, St. Joseph, Trinidad, 9.viii.1947, I.C.T.A. 1494 (typus) in Herb. R.B.G. Kew.

Omphalia flavida Maubl. & Rangel in *Bull. Soc. mycol. Fr.* xxx, p. 46, 1914.

On *Coffea arabica*, Caura valley, 1933, I.C.T.A. 15.

The cause of the 'Viruela' or American leaf disease of *Coffea arabica*. Also found on *Borreria laevis* growing near infected coffee bushes and said to attack citrus and certain ferns.

The fructifications, which are luminous, are not formed on coffee, but can easily be produced in culture on a rich, starchy medium such as damp bread

Omphalina subscyphoides Murr., *N. Amer. Flora*, ix, p. 348, 1916.

Pileus umbilicate with a crenate margin, 1·5 cm. diam., pure white, dry. *Stipe* white, enlarged upwards, hollow. *Gills* few, narrow, distant, deeply decurrent. *Flesh* thin, white. *Spores* hyaline, subglobose with a large apiculus, non-amyloid, 6 × 5 μ. Fig. 39. Plate Id.

FIG. 39. *Omphalina subscyphoides*. (a) spores × 500.

On the ground, Bamboo Plantation, St. Joseph, 2.ix.1947, I.C.T.A. 1559.

Panaeolus cyanescens (Berk. & Br.) Sacc., Syll. Fung. v, p. 1123, 1887.

Pileus cream coloured with a blue-black hue when moist, up to 3·5 cm.; cuticle of nearly globose cells about 20 μ diam., cracking when dry. *Stipe* cylindrical with a small bulbous base, concolorous. *Gills* adnexed, arcuate. *Spores* dark purplish-brown under the microscope, blue-black in mass, lemon-shaped but laterally compressed with an apical germ-pore,

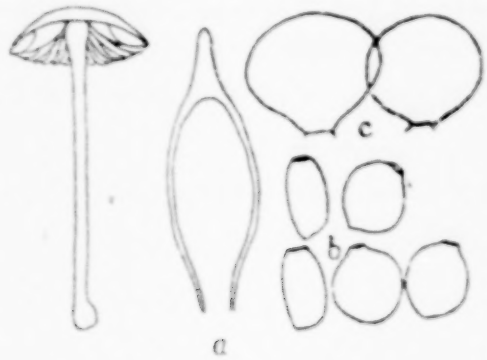


FIG. 40. *Panaeolus cyanescens*. (a) marginal cystidium ×500; (b) spores ×500; (c) cuticle cells in section ×500.

11–13×10×7–8 μ. *Cystidia* abundant all over the gills, with a thick-walled beak, 35–40×15 μ. Fig. 40. Plate IVe.

St. Augustine 17.v.1947, I.C.T.A. 1434 and 20.v.1947, I.C.T.A. 1437. One of the common coprophilous species; found all the year round. Distinguished by the distinct blue tint of the spores in mass.

Panus rudis Fr., Epicr. Myc., p. 398, 1838.

Blanchisseuse, 15.v.1908, Broadway 3835 in Herb. R.B.G. Kew (see Pilát in *Ann. mycol., Berl.*, xxxiv, pp. 131–132, 1936).

Paxillus atrotomentosus (Fr.) Fr. var. **bambusinus** Baker & Dale var. nov.

A typo differt statura minore (*pileus* ad 11 cm. diam., *stipes* 3·5 cm. longus, 1·5 cm. crassus, plerumque minor), et *sporis* paullum minoribus, 3·5–4·5×3 μ. Plate IId.

Ad truncos bambusarum, Bamboo Plantation, St. Joseph, Trinidad, 2.ix.1947, I.C.T.A. 1557 (typus) in Herb. R.B.G. Kew.

Pleurotus commiscibilis (Berk. & Curt.) Sacc., Syll. Fung., v, p. 353, 1887.

Crepidopus commiscibilis (Berk. & Curt.) Murr., *N. Amer. Flora*, ix, p. 306, 1916.

A small white delicate species found frequently on dead wood in wet weather, fide Rayner, 1941, I.C.T.A. 7 and 41.

Pleurotus flabellatus (Berk. & Br.) Sacc., Syll. Fung., v, p. 369, 1887.

On dead wood, Grand Riviere, 15.vi.1947, I.C.T.A. 1464.

Pleurotus hemiphlebius (Berk. & Curt.) Sacc., Syll. Fung., v, p. 369, 1887.

Probably this species, Mt. Tucuche, 5.vi.1947, I.C.T.A. 1451.

[**Pluteus cervinus** (Schaeff. ex Fr.) Quél., Champ. Jura Vosg., p. 81, 1872.

Rayner recorded specimens closely resembling this common temperate species from the forest above St. Augustine and from near the Blue Basin in the Diego Martin valley.]

837

Pluteus cervinus (Schaeff ex. Fr.) Quél. var. **bambusinus** Baker & Dale var. nov. A typo differt statura minore (*pileus* 4–4·5 cm. diam., *stipes* 5–6 cm. longus, 3–5 mm. crassus) et in colore purpureo-livido. *Sporae* late ellipticae,

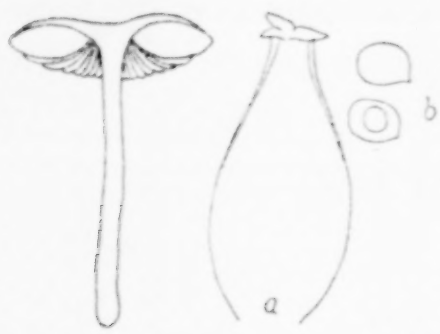


FIG. 41. *Pluteus cervinus* var. *bambusinus*.
(a) marginal cystidium ×500; (b) spores ×500.

7×5–6 μ. *Cystidia* ut in typo sed latiora, circa 50×18–25 μ. Fig. 41. Plate IIe.

Solitarius, ad truncos bambusarum, Bamboo Plantation, St. Joseph, Trinidad, 9.viii.1947, I.C.T.A. 1495 (typus) in Herb. R.B.G. Kew.

[**Psathyra fatua** Fr., Syst. Myc., i, p. 296, 1821.

On the ground near a log, Belmont, Broadway 3222, det. Bresadola (*Ann. mycol., Berl.*, ix, p. 552, 1911).]

Psathyrella trinitatensis Baker & Dale sp. nov.

Pileus 1·5–2 cm. diam., conico-campanulatus, pallide fuscus, ad marginem striatus et brunneus, sicco pallidior, cuticula e cellulis globosis tenuiter tunicatis composita, 20–25 μ diam. *Stipes* albidus, 3·5–5 cm. longus,

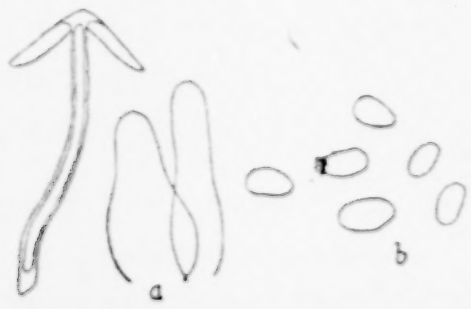


FIG. 42. *Psathyrella trinitatensis*.
(a) marginal cells from gill ×500; (b) spores ×500.

1–3 mm. crassus, supra leniter attenuatus, fragilis, fistulosus. *Contextus* albus, laevis, hygrophanus. *Lamellae* atro-purpureae, adnatae, ad 2 mm. latae, margine pilis latis cylindraceis vel ampulliformibus tenuiter tunicatis, 7–15 μ crassis praeditae. *Sporae* fusco-purpureae in masso, 7–10×3·5–5 μ. Fig. 42. Plate IVc.

Gregariosus et caespitosus, ad terram sub arboribus, St. Augustine, Trinidad, 22.vi.1947, I.C.T.A. 1469 (typus) in Herb. R.B.G. Kew.

Schizophyllum commune Fr., Obs. Myc., i, p. 103, 1815.

On coco-nut stump, Manzanilla, Rayner, 27.xi.1938, I.C.T.A. 16.

On dead wood, St. Augustine, 27.vii.1947, I.C.T.A. 1532. A very common fungus on dead wood, especially bamboo; usually smaller and more lobed than the English form.

In the 1911 list; also collected by Britton *et al.* in 1920.

For notes on the synonymy see Rayner 1941 (loc. cit.).

and sometimes serious on celery. According to Johnson & Valleau (1949) *C. beticola*, *C. nicotianae*, *C. bloxami* [= *C. brassicola*], *C. brachiata*, *C. canescens*, *C. cruenta*, and *C. ricinella* are synonyms of *C. apii*.

Cercospora atromarginalis Atk. in *J. Elisha Mitchell sci. Soc.*, viii, p. 59, 1892.

On *Solanum nigrum*, Chacachacare Is., Chardon, Fungi of Trinidad No. 38; St. Augustine, 17.vii.1944, I.C.T.A. 189; Diego Martin, 5.xii.1944, I.C.T.A. 314.

Cercospora batatae Zimm. in *Ber. Land- u. Forstwirt. D. Ostafr.*, p. 28, 1904.

On *Ipomoea batatas* and *Ipomoea* sp., W. F. Steven, St. Augustine, June 1934, I.M.I. 7906.

[Cercospora beticola Sacc. in F. Ven., Ser. v, x, p. 189, 1876.

On *Beta vulgaris*, St. Augustine, C. A. Thorold, 1930. Occasionally severe on garden beetroot; presumably seed-borne.]

Cercospora bidentis Tharp. in *Mycologia*, ix, p. 108, 1917.

On *Bidens pilosa*, W. F. Steven, St. Augustine, June 1934, I.M.I. 7882.

Cercospora bixae Allesch. & Noack in *Bol. Ist. Agron. do Estado de Sao Paulo em Campinas*, ix, p. 85, 1898.

On *Bixa orellana*, W. F. Steven, St. Augustine, May 1933, I.M.I. 7783.

Cercospora borreriae Ellis & Everh. in *Proc. Acad. nat. Sci. Philad.*, xlvi, p. 379, 1894.

On *Borreria latifolia*, Pitch lake, 23.iii.1947, I.C.T.A. 1384.

On *Borreria* sp., W. F. Steven, 1934.

Cercospora brachiata Ellis & Everh. in *J. Mycol.*, iv, p. 5, 1888.

On *Amaranthus sp.*, W. F. Steven, St. Augustine, June 1934, I.M.I. 7701.

Cercospora bradburyae Young in *Mycologia*, viii, p. 46, 1916.

On *Cassia grandis*, W. F. Steven, St. Augustine, Oct. 1934, I.M.I. 8181.

Cercospora brassicola P. Henn. in *Bot. Jahrb.*, xxxvii, p. 166, 1906.

On *Brassica chinensis*, St. Augustine, C. A. Thorold, Apr. 1930, I.M.I. 7936; Aranjuez estate, San Juan, W. F. Steven, 11.iv.1934, I.M.I. 7937; 15.iv.1944, I.C.T.A. 101.

On *Brassica juncea*, St. Augustine, 13.iv.1944, I.C.T.A. 102.

Common and sometimes severe in wet weather on varieties of Chinese cabbage and Indian mustard.

[Cercospora cajani P. Henn. in *Hedwigia*, xli, p. 309, 1902.

On *Cajanus indicus*, W. F. Steven, 1934.]

Cercospora canavaliae Syd. in *Ann. mycol. Berl.*, xii, p. 203, 1914.

On *Canavalia ensiformis*, W. F. Steven, St. Augustine, Apr. 1934, I.M.I. 8169.

Cercospora canescens Ellis & Martin in *Amer. Nat.*, xvi, p. 1003, 1882.

On *Dolichos lablab*, W. F. Steven, St. Augustine, May 1934, I.M.I. 8207.

On *Phaseolus aconitifolius*, C. A. Thorold, St. Augustine, Apr. 1930, I.M.I. 8257 and 8258.

On *Phaseolus mungo*, C. A. Thorold, St. Augustine, Nov. 1929, I.M.I. 8256

838

and Feb. 1930, I.M.I. 8255; W. F. Steven, St. Augustine, Mar. 1934, I.M.I. 8254; St. Augustine, 3.xii.1945, I.C.T.A. 752.

On *Phaseolus vulgaris*, St. Augustine, Mar. 1934, I.M.I. 8253.

Cercospora capsici Heald & Wolf in *Mycologia*, iii, p. 15, 1911.

On *Capsicum annuum*, W. F. Steven, St. Augustine, June 1934, I.M.I. 8460; 22.vi.1944, I.C.T.A. 160.

Cercospora carbonacea Miles in *Trans. Ill. Acad. Sci.*, x, p. 255, 1917.

On *Dioscorea alata*, Maraval valley, 16.i.1921, E. M. Wakefield 213 in Herb. R.B.G. Kew; St. Augustine, C. E. Chardon, Fungi of Trinidad No. 1, 3.xii.1944; 8.xii.1944, I.C.T.A. 321. As *Cercospora nubilosa* Ellis & Everh., W. F. Steven in 1937 list.

Although sometimes very common, this species is usually confined to the older leaves towards the end of the growing period and therefore does little damage.

Cercospora caseariae Stevens in *Trans. Illinois Acad. Sci.*, x, p. 212, 1917.

On *Casearia* sp., Fort George, 14.i.1921; Bot. Gardens, 17.i.1921; E. M. Wakefield, both in Herb. R.B.G. Kew.

Cercospora clavata (Gerard) Cooke in *Grevillea*, iv, No. 30, p. 69, 1875.

On *Asclepias curassavica*, Tabaquite forest, 9.iii.1947, I.C.T.A. 1355.

Cercospora cochlospermi Baker & Dale sp. nov.

Maculae suborbiculares vel irregulares, limitatae, 3–25 mm. diam., sordide rubro-brunneae. *Plagulae* plerumque epiphyllae. *Stromata* atro-brunnea, sub-globosa vel applanata, 20–25 μ diam. *Caespituli* densi, compacti. *Conidiophora* vel brevis ut cellula sub-elongata ex stromatis peripherico proeminens, vel longiora, simplicia, raro septata, recta vel undulata, apicem versus obtusum attenuata, haud geniculata, pallide, olivaceo-brunnea, ad 10–25 μ longa, 2–3·5 μ lata. *Conidia* hyalina vel subhyalina, linearia, vel subacicularia, indistincte multiseptata, recta vel fortiter curvata, basi subtruncata, apice acuta, 15–110 μ longa, 1·5–3 μ lata.

Hab. in foliis *Cochlospermi vitifolii*, St. Augustine, 31.x.1945, I.C.T.A. 743 (typus).

Cercospora coffeicola Berk. & Curt. in *Grevillea*, ix, p. 99, 1881.

On *Coffea arabica*, Caura valley, W. F. Steven, Mar. 1934, I.M.I. 842.

On *Coffea robusta*, Nonpareil estate, 6.xii.1944, C. E. Chardon, Fungi of Trinidad, No. 20.

On *Coffea* sp., Maracas valley, 20.i.1921, E. M. Wakefield 261; Morne Bleu, 27.i.1921, E. M. Wakefield 331; both in Herb. R.B.G. Kew.

Cercospora costeroana Petrak & Ciferri in *Ann. mycol., Berl.*, xxx, p. 311, 1932.

On *Solanum jamaicense*, Quinam, 30.ix.1947, I.C.T.A. 1692; Mausica savannah, 18.x.1947, I.C.T.A. 1732.

Cercospora crotonis Ellis & Everh. in *Proc. Acad. nat. Sci. Philad.*, xlv, p. 170, 1893.

On *Croton lobatus*, St. Augustine, 29.vii.1947, I.C.T.A. 1526.

Cercospora cruenta Sacc. in *Michelia*, ii, p. 149, 1880.

On *Phaseolus aconitifolius*, C. A. Thorold, St. Augustine, 1930.

On *Vigna unguiculata*, Trinidad list 1911; C. A. Thorold, St. Augustine, 1930,

W. F. Steven, Mar.–Apr. 1934, I.M.I. 8288, 8289; San Juan, 15.vii.1944, I.C.T.A. 190.

On *Canavalia ensiformis*, St. Augustine, 10.iv.1946, I.C.T.A. 993.

According to Professor Chupp it is not certain that this *Cercospora* on *Canavalia* is identical with the one on *Vigna* and *Phaseolus*, although it seems to have the same characters. Cross-inoculations should be made.

Cercospora canavaliae Syd. causes no definite spots but produces effuse *Cladosporium*-like conidiophores without fascicles.

Cercospora curatellae Syd. in *Ann. mycol., Berl.*, xxviii, p. 208, 1930.

On *Curatella americana*, Mausica savannah, 4.xii.1947, I.C.T.A. 1788; Erin savannah, 29.ii.1948, I.C.T.A. 1898.

Cercospora demetrioniana Wint. in *Hedwigia*, xxiii, p. 170, 1884.

On *Crotalaria juncea*, W. F. Steven, St. Augustine, Apr. 1934, I.M.I. 8193.

Cercospora dolichi Ellis & Everh. in *J. Mycol.*, v, p. 71, 1889.

On *Dolichos lablab*, W. F. Steven, 1934, I.M.I. 8206.

Cercospora effusa (Berk. & Curt.) Ellis in *J. Mycol.*, 1, p. 53, 1885.

On *Isotoma longiflora*, Diego Martin, 18.iv.1944, I.C.T.A. 110; Maraval, 25.iii.1946, I.C.T.A. 989; St. Augustine, 16.ii.1947, I.C.T.A. 1099.

Cercospora euphorbiae Kel. & Sw. in *J. Mycol.*, v, p. 76, 1889.

On *Euphorbia heterophylla*, St. Augustine, 13.iv.1944, I.C.T.A. 128.

Cercospora fusco-virens Sacc. in *Michelia*, ii, p. 149, 1880.

On *Passiflora foetida*, St. Augustine, 18.ii.1947, I.C.T.A. 1323.

Cercospora fusimaculans Atk. in *J. Elisha Mitchell Sci. Soc.*, viii, p. 50, 1892.

Cercospora panici Davis in *Trans. Wis. Acad. Sci. Arts Letts.*, xix, p. 714, 1919.

On *Panicum mertensii*, Caroni swamp, 2.x.1945, I.C.T.A. 742.

On *Panicum maximum*, W. F. Steven, St. Augustine, June 1934, I.M.I. 8207.

Cercospora gliricidiasis Frag. & Cif. in *Rem. Dom. Est. Haina*, Ser. B, Bot. Bul. iv, p. 9, 1929.

Cercospora gliricidiae Syd. forma *gliricidiasis* Frag. & Cif. in *Bol. Soc. esp. Hist. nat. Madrid*, xxvii, p. 176, 1927.

On *Gliricidia sepium*, St. Clair, 14.i.1921, E. M. Wakefield 185 in Herb. R.B.G. Kew; W. F. Steven, St. Augustine, Apr. 1934, I.M.I. 8222; Arden Estate, Tobago, 30.iii.1944, I.C.T.A. 150.

Professor Chupp considers this species to belong to the genus *Pseudocercospora* rather than *Cercospora* because of its broad, obclavate, thick-walled conidia.

Cercospora gossypina Cooke in *Grevillea*, xii, p. 31, 1883.

On *Gossypium hirsutum*, W. F. Steven, St. Augustine, Apr. 1934, I.M.I. 8299.

Cercospora hemidiodiae Toro in *J. Dep. Agric. P.R.*, xiv, p. 288, 1930.

On *Borreria laevis*, St. Clair, 26.i.1921, E. M. Wakefield 306 in Herb. R.B.G. Kew; St. Augustine, 23.iv.1946, I.C.T.A. 1001; 16.i.1947, I.C.T.A. 1057.

Cercospora henningsii Allesch. in Engler, Pflanzenwelt. Ost-Afrikas, Teil C, p. 35, 1895.

839

On *Manihot utilissima*, Nowell, Diseases of Crop Plants, p. 335, 1923; St. Augustine, C. A. Thorold, 1929; W. F. Steven, 1934; 30.iii.1944, I.C.T.A. 144.

Common but usually confined to the older leaves and of little importance.

Cercospora hibisci Tracy & Earle in *Bull. Torrey bot. Cl.*, xxii, p. 179, 1895.

On *Hibiscus esculentus*, W. F. Steven, 1934; St. Augustine, 16.x.1944, I.C.T.A. 235; on *Hibiscus sabdariffa*, St. Augustine, C. A. Thorold, 1930 (det. at Imp. Myc. Inst.).

Sometimes common, but usually confined to the older leaves and of little importance.

Cercospora jahnii Syd. in *Ann. mycol. Berl.*, xxviii, p. 214, 1930.

On *Tabebuia pentaphylla*, W. F. Steven, St. Augustine, Dec. 1933, I.M.I. 7777.

Cercospora longissima Traverso in *Malpighia*, p. 57, 1903 [non Cooke & Ellis, 1888.]

On *Lactuca sativa*, St. Augustine, C. A. Thorold, 1930; W. F. Steven, June 1934, I.M.I. 7897; 17.v.1944, I.C.T.A. 136.

Cercospora lythracearum Heald & Wolf in *Mycologia*, iii, p. 18, 1911.

On *Lagerstroemia indica*, W. F. Steven, St. Augustine, June 1934, I.M.I. 8056.

Cercospora malachrae Heald & Wolf in *Mycologia*, iii, p. 12, 1911.

On *Malachra fasciata*, W. F. Steven, 1934; Tobago, 30.xii.1945, I.C.T.A. 794; Quinam, 30.ix.1947, I.C.T.A. 1712.

Cercospora malayensis Stev. & Solh. in *Mycologia*, xxiii, p. 394, 1931.

On *Abelmoschus moschatus*, St. Augustine, 11.ii.1947, I.C.T.A. 1085.

On *Hibiscus sabdariffa*, C. A. Thorold, St. Augustine, Dec. 1929, I.M.I. 8314.

Cercospora maracasensis Baker & Dale sp. nov.

Maculae distinctae sub-orbiculares, 4–30 mm. diam., in primis viridi-brunneae, graduatim luteolo-alutaceae vel griseae, linea atro-rubra vel atra limitatae. *Plagulae* plerumque epiphyllae. *Stromata* suborbicularia, applanata, luteo-brunnea, 30–60 μ diam. *Caespituli* densi, compacti vel divergentes. *Conidiophora* pallide olivaceo-brunnea, in colore latitudineque uniformia, pauce septata, simplicia, haud geniculata, recta vel tenuiter curvata, apice obtuso vel conico praedita, 30–135 μ longa, 3–5·5 μ lata. *Conidia* sub-hyalina vel pallide olivacea, obclavato-cylindracea, recta vel curvata, indistincte multiseptata, basi obconico-truncato, apice subobtuso praedita, vacuolata, 35–110 μ longa, 3–5 μ lata.

Hab. in foliis *Commelinae elegantis*, Maracas valley, Trinidad, 4.x.1944, Baker, I.C.T.A. 226 (typus).

Cercospora micranthae Mull. & Chupp in *Arch. Inst. Biol. Veg. Rio de Janeiro*, iii, p. 95, 1936.

On *Sida cordifolia*, Icacos, 15.ix.1945, I.C.T.A. 707.

Cercospora nicotianae Ellis & Everh. in *Proc. Acad. Nat. Sci. Philad.*, xlv, p. 170, 1893.

On *Nicotiana tabacum*, W. F. Steven, St. Augustine, Jan. 1934, I.M.I. 8467; 13.iv.1944, I.C.T.A. 117.

Frog-eye spot is common on the lower leaves of tobacco and may cause appreciable damage and loss of crop.

Cercospora nigricans Cooke in *Grevillea*, xii, No. 61, p. 30, 1883.

On *Cassia tora*, Scarborough, Tobago, 20.viii.1947, I.C.T.A. 1602.

Cercospora oliganthidis Baker & Dale sp. nov.

Maculae in primo indistinctae, in pagina superiore areas luteas irregulares, dein brunneae et plerumque abscissae effermantes. *Plagulae* tantum sub microscopio composito visibiles. *Conidiophora* ut rami singuli ex hyphis procumbentibus oriunda, pallide olivacea vel olivaceo-brunnea, sparse septata, apicem versus obtusum vel conicum, interdum incrassata et dein multi cicatricibus pluribus praedita, 10–70 μ (plerumque 10–40 μ) longa, 3–4·5 μ lata. *Conidia* pallidissime olivacea, obclavato-cylindracea, 1–5 septata, toto vel fere recta, basi rotundato vel obconico-truncato, apice obtuso praedita, 25–55 μ longa, 3–4 μ lata.

Hab. in foliis *Oliganthidis condensati*, Mt. Tabor, Trinidad, 14.xii.1947, Baker, I.C.T.A. 1793 (typus).

Cercospora oxalidiphila (Speg.) Chupp & Muller in *Bol. Soc. venez. Cienc. nat.*, viii, p. 52, 1942.

On *Oxalis barrelieri*, Lopinot valley, 31.viii.1947, I.C.T.A. 1683.

Cercospora personata (Berk. & Curt.) Ellis & Everh. in *J. Mycol.*, i, p. 63, 1885.

On *Arachis hypogaea*, W. Nowell, Diseases of Crop Plants, p. 339, 1923; W. F. Steven, St. Augustine, Nov. 1933, I.M.I. 8065; 15.ii.1946, I.C.T.A. 972.

Together with *Puccinia arachidis* this species is almost universally present on groundnuts, but is seldom serious.

Cercospora piperis Pat. in *Bul. Soc. mycol. Fr.*, xi, p. 233, 1895.

On *Piper aduncum*, La Seiva valley, 5.iv.1946, I.C.T.A. 996; North Coast rd., 3.iii.1947, I.C.T.A. 1354.

On *Piper tuberculatum*, St. Augustine, 18.ii.1947, I.C.T.A. 1119.

On *Piper umbellatum*, 11th mile Arima–Blanchisseuse rd., I.C.T.A. 1553.

On *Piper* sp., Arima valley, 17.viii.1947, I.C.T.A. 1551.

Cercospora ricinella Sacc. & Berl. in *Atti. Ist. Veneto*, vi, p. 721, 1885.

On *Ricinus communis*, St. Augustine, C. A. Thorold, 1930; W. F. Steven, 1934; 13.iv.1944, I.C.T.A. 122.

Cercospora ricini Speg., Fung. Argent. nov. vel crit., p. 343, 1899.

On *Ricinus communis*, W. F. Steven, St. Augustine, Apr. 1934, I.M.I. 8010.

This occurs side by side with *C. ricinella*, and can be distinguished from it by the smaller size of the spot, with a white centre, and by the spore dimensions.

Cercospora rosicola Pass. in Thüm, Mycotheca Univ., no. 333, 1876.

On *Rosa* sp. (cultivated), in 1911 list; W. F. Steven, St. Augustine, June 1934, I.M.I. 8416.

840

Cercospora sebastianiae Baker & Dale sp. nov.

Maculae indistinctae, in pagina superiore areas luteas effermantes. *Plagulae* in pagina inferiore effusae, 2–6 mm. diam., atro-olivaceae vel fuliginosae. *Stromata* nulla vel ex cellulis paucis composita. *Conidiophora* plerumque 5–20 fasciculata divergentiaque, pallide vel modice olivaceo-brunnea, superne undulata, apicem versum conicum interdum attenuata, multiseptata, ramosa, haud geniculata, 20–125 μ longa, 4–5·5 μ lata. *Conidia* pallide olivacea, cylindracea, recta vel tenuiter curvata, 3–11 septata, basi rotundato vel breviter obconico, apice obtuso vel conico praedita, 30–85 μ longa, 4–5·5 μ lata.

Hab. in foliis *Sebastianiae corniculatae*, St. Augustine, Trinidad, 20.viii.1947, Baker, I.C.T.A. 1552 (typus); same locality, 1.ix.1945, I.C.T.A. 684; Lopinot valley, 31.viii.1947, I.C.T.A. 1684.

Cercospora sesami Zimm. in *Ber. Land- u. Forstwirt. D. Ostafr.*, p. 28, 1904.

On *Sesamum indicum*, St. Augustine, C. A. Thorold, Dec. 1929, I.M.I. 8372; W. F. Steven, St. Augustine, May 1934, I.M.I. 8371. The small lesions caused by this fungus are exceedingly abundant, but the disease is of only minor importance.

Cercospora solani-asperi Baker & Dale sp. nov.

Maculae haud vel aegre visibiles, vel in pagina inferiore areas luteas effermantes. *Stromata* nulla. *Plagulae* effusae, olivaceae. *Conidiophora* ex hyphis procumbentibus ut rami breves vel elongati oriunda, pallidissime olivacea, in colore latitudineque uniformia, ramosa, pauce septata, haud geniculata, apice obtusa, 10–60 μ longa, 3–5 μ lata. *Conidia* pallide olivacea, obclavata, recta vel curvata, septis indistinctis 3–11 praedita, basi obconica, apice subacuta, 30–80 μ longa, 3–4 μ lata.

Hab. in foliis *Solani asperi*, Arima forest reserve, Trinidad, 25.x.1947, I.C.T.A. 1729 (typus).

Cercospora solani-hirti Baker & Dale sp. nov.

Maculae indistinctae in pagina superiore areas brunneas, raro atro marginatas, in pagina inferiore tenuiter sordidas effermantes. *Stromata* nulla. *Conidiophora* ut rami ex hyphis procumbentibus oriunda, plerumque singula, raro pseudo-fasciculata, cylindracea, unifermiter pallidissime olivacea, sparse ramosa, haud vel raro geniculata, apice conica vel rotundata, 15–100 μ longa, 3–4·5 μ lata. *Conidia* pallidissime olivacea, cylindracea vel obclavato-cylindracea, recta vel curvata, 3–7 septata, basi longe vel breviter obconico truncato, apice obtuso praedita, 30–75 μ longa, 3–4·5 μ lata.

Hab. in foliis *Solani hirti*, Grand Rivière, Trinidad, 15.vi.1947, I.C.T.A. 1521 (typus).

The conidia of this species are narrower and more nearly cylindric than in any of the non-fasciculate forms on *Solanum*.

Cercospora solani-torvi Frag. & Cif. in *Rep. Dom. Est. Agr. Moca*, Ser. B, Bot., Bul. xi, p. 66, 1927.

Cercospora trichophila Stev. in *Trans. Ill. Acad. Sci.*, v, p. 212, 1917.

On *Solanum torvum*, San Juan, 2.x.1945, I.C.T.A. 741.

Cercospora sorghi Ellis & Everh. in *J. mycol.*, iii, p. 15, 1887.

On *Sorghum vulgare*, Palmiste, C. A. Thorold, Feb. 1930, I.M.I. 73; W. F. Steven, St. Augustine, May 1934, I.M.I. 72.

On *Zea mays*, C. A. Thorold, St. Augustine, Mar. 1930, I.M.I. 66.

Cercospora stachytarphetae Ellis & Everh. in *Rep. Mo. Bot. Gard.*, ix, p. 120, 1898.

On *Stachytarpheta jamaicensis*, Icacos, 15.ix.1945, I.C.T.A. 728; Tobago, 30.xii.1945, I.C.T.A. 802; 24.viii.1947, I.C.T.A. 1583. According to Chupp the later homonym *Cercospora stachytarphetae* P. Henn. in *Hedwigia*, xlviii, p. 18, 1909 is a distinct species.

Cercospora stemodiae Syd. in *Ann. mycol., Berl.*, xxxvii, p. 433, 1939.

On *Stemodia durantifolia*, Tabaquite forest, 9.iii.1947, I.C.T.A. 1356.

Cercospora stigmaphyllonis Baker & Dale sp. nov.

Maculae orbiculares vel irregulares, 1–10 mm. diam., vel confluendo majores, atro-brunneae vel fere atrae, margine lato, aurantiaco vel badio limitatae. *Plagulae* amphigenae. *Stromata* subglobosa vel irregularia, atro-brunnea. *Conidiophora* dense vel densissime fasciculata, compacta, pallide olivaceo-brunnea, in colore crassitudineque uniformia, vel apicem versus pallidiora, multiseptata, sparse ramosa, raro geniculata, si longiora apicem versus rotundatum vel conicum patentia, 20–100 μ longa, 3–4·5 μ lata. *Conidia* subhyalina vel pallide olivacea, obclavata vel obclavato-cylindracea, recta vel fortiter curvata, 1–5 septata, basi rotundato vel obconico, apice obtuso praedita, 30–75 μ longa, 3·5–6 μ lata.

Hab. in foliis *Stigmaphyllonis convolvulifolii*, Tabaquite forest, 9.iii.1947, Baker, I.C.T.A. 1357 (typus); Gran Couva, 26.ii.1947, I.C.T.A. 1368; Icacos, 23.iii.1947, I.C.T.A. 1382; Siparia quarry, 2.x.1947, I.C.T.A. 1701.

Cercospora stizolobii H. & P. Sydow in *Ann. mycol., Berl.*, xi, p. 270, 1913.

On *Stizolobium aterrimum*, St. Augustine, C. A. Thorold, 1931; W. F. Steven, June 1934, I.M.I. 8247; 30.iii.1944, I.C.T.A. 145.

[Cercospora tectoniae Stev. in *Bull. Bernice P. Bishop Mus.* 19, p. 155, 1925.

On *Tectona grandis*, W. F. Steven, 1934.]

Cercospora ternateae Petch in *Ann. R. bot. Gdns. Paradeniya*, v, p. 306, 1909.

Cercospora pantoleuca H. & P. Syd. in *Philipp. J. Sci.*, viii, p. 284, 1913.

On *Clitoria ternatea*, W. F. Steven, St. Augustine, May 1934, I.M.I. 8189.

Cercospora tithoniae Baker & Dale sp. nov.

Maculae suborbiculares vel irregulares, 2–3 mm. diam., brunneae, margine luteo vel aurantiaco limitatae. *Plagulae* plerumque hypophyllae. *Stromata* nulla vel ex cellulis paucis brunneis composita. *Conidiophora* 2–8 fasciculata, divergentia, pallide olivacea, in colore crassitudineque uniformia, plerumque recta, raro septata, haud geniculata, simplicia, apice rotundato vel conico, cicatrice parvo ornata, 20–60 μ longa, 3–4 μ lata. *Conidia* subhyalina vel pallidissime olivacea, obclavato-cylindracea, 1–5 septata, raro

841

catenulata, recta vel tenuiter curvata, basi obconico-truncato, apice obtuso praedita, 25–65 μ longa, 3–4 μ lata.

Hab. in foliis *Tithoniae diversifoliae*, Lopinot valley, Trinidad, 1.xi.1947, I.C.T.A. 1727 (typus).

Cercospora vanderysti P. Henn. in *An. Mus. Congo Belge*, Bot. Sér. Va, Fasc. 2, p. 104, 1907.

On *Vigna repens*, Maracas bay, 3.iii.1947, I.C.T.A. 1353.

Cercospora vignae-vexillatae Baker & Dale sp. nov.

Maculae nullae vel in pagina superiore areas luteolas indistinctas effermantes. *Plagulae* in pagina inferiore, effusae, grisiae vel griseo-olivaceae, vel millemetras paucas vel paginam totam vestientes. *Stromata* nulla. *Conidiophora* ut rami ex hyphis procumbentibus oriunda, haud fasciculata, pallide olivaceo-brunnea, in colore crassitudineque uniformia, multiseptata, 0–3 geniculata, plerumque fortiter arcuata vel aliter tortuosa, apice conico praedita, 50–500 μ longa, 3–4·5 μ lata. *Conidia* hyalina vel pallide olivacea, obclavato-cylindracea, recta vel curvata, 1–5 septata, basi obconico-truncato, apice obtuso praedita, 20–45 μ longa, 4–5·5 μ lata.

Hab. in foliis *Vignae vexillatae*, San Juan, Trinidad, 5.ii.1948, Baker, I.C.T.A. 1872 (typus); Icacos, 15.ix.1945, I.C.T.A. 709.

Cercospora vitis (Lév.) Sacc. in *Nuovo G. Bot. italia*, viii, p. 188, 1876.

Pseudocercospora vitis (Lév.) Speg. in *Anal. Mus. Nac. B. Aires*, xx, p. 437, 1910.

On *Vitis vinifera*, St. Augustine, 4.xi.1944, I.C.T.A. 258.

Cercospora zinniae Ellis & Martin in *J. Mycol.*, i, p. 20, 1885.

Cercospora atricincta Heald & Wolf in *Mycologia*, iii, p. 14, 1911.

On *Zinnia elegans*, W. F. Steven, St. Augustine, June 1934, I.M.I. 4155; 8.i.1948, I.C.T.A. 1870.

Common on the older leaves, but usually doing no serious harm.

Cladosporium fulvum Cooke in *Grevillea*, xi, p. 32, 1883.

On *Lycopersicon esculentum*, Trinidad list 1911; St. Augustine, 30.iii.1944, I.C.T.A. 149. Under Trinidad conditions tomato leaf mould is both common and serious. It is one of the causes which contribute to the frequent failure of tomato crops, especially during wet weather.

[**Cladosporium herbarum** [Pers.] Link ex Fr., Syst. Mycol., iii, 2, p. 370, 1832.

On glumes of *Sorghum* sp. and leaves of *Eleusine coracana*, C. A. Thorold, St. Augustine, 1930.

See note under *Hormodendrum cladosporioides*.]

[**Clasterosporium maydicum** Sacc. in *Nuovo G. Bot. ital.*, xxiii, p. 213, 1916.

From banana material, C. W. Wardlaw; also on citrus, 1935.]

Curvularia lunata (Wakker) Boedijn in *Bull. Jard. bot. Buitenzorg*, Sér. 3, xiii, p. 127, 1933.

Acrothecium lunatum Wakker, De Ziekten van het Suikerriet op Java, Leiden, p. 196, 1898.

On millets, *Coix lachryma-jobi*, *Fagopyrum* sp., &c., widely distributed as a

Stropharia caespitosa Murr. in *Mycologia*, x, p. 71, 1918.

Pileus hemispherical, up to 4 cm. diam., light brownish-olive, darker at the disk, striate at the margin, dotted with small rounded brown squamules, made of globose thin-walled cells up to 30 μ diam., which are easily rubbed off. *Stipe* cylindrical, whitish, smooth, hollow. *Ring* persistent, white, with

FIG. 43. *Stropharia caespitosa*. (a) cells from squamules $\times 500$; (b) spores (of two sizes) $\times 500$.

brown squamules at the edge, attached about the middle of the stipe. *Flesh* very thin, white. *Gills* crowded, adnate, narrow, pinkish-brown. *Spores* dark grey-brown, elliptical with an apical germ pore, of two sizes, majority 6–8 $\times$ 3–3·5 μ, others about 10 $\times$ 4–4·5 μ. Fig. 43. Plate Ie.

Caespitose on or near the base of living trees, St. Augustine, 26.vi.1947, I.C.T.A. 1476.

Stropharia semiglobata (Batsch. ex Fr.) Quél., Champ. Jura Vosg., p. 112, 1872.

On the ground in pastures; large specimens may be up to 7 cm. in diameter. St. Augustine, 27.vii.1947, I.C.T.A. 1484. For figures see Cooke, Illustr. Brit. Fungi, Pl. 566, 567, and Lange, Flora Agaricina Danica, iv, Pl. 142 A and D.

Tricholoma pachymeres (Berk. & Br.) Sacc., Syll. Fung., v, p. 120, 1887.

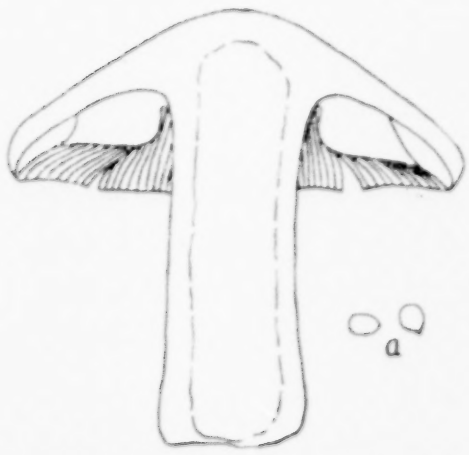


FIG. 44. *Tricholoma pachymeres*. (a) spores $\times 500$.

Pileus campanulate, up to 10 cm. diam., light brown, becoming very pale towards the margin, dry, smooth, cracking at the margin. *Stipe* cylindrical, slightly swollen at the base, white, with greyish fibrils and small recurved scales, tough, with a firm rind enclosing a spongy pith. *Flesh* thick, white, tough. *Gills* very crowded, white, up to 1 cm. broad, sharply and deeply sinuate. *Spores* hyaline, subglobose, non-amyloid, 5–5·5 $\times$ 4 μ. Smell pleasant, like cultivated mushrooms. Fig. 44. Plate Ig.

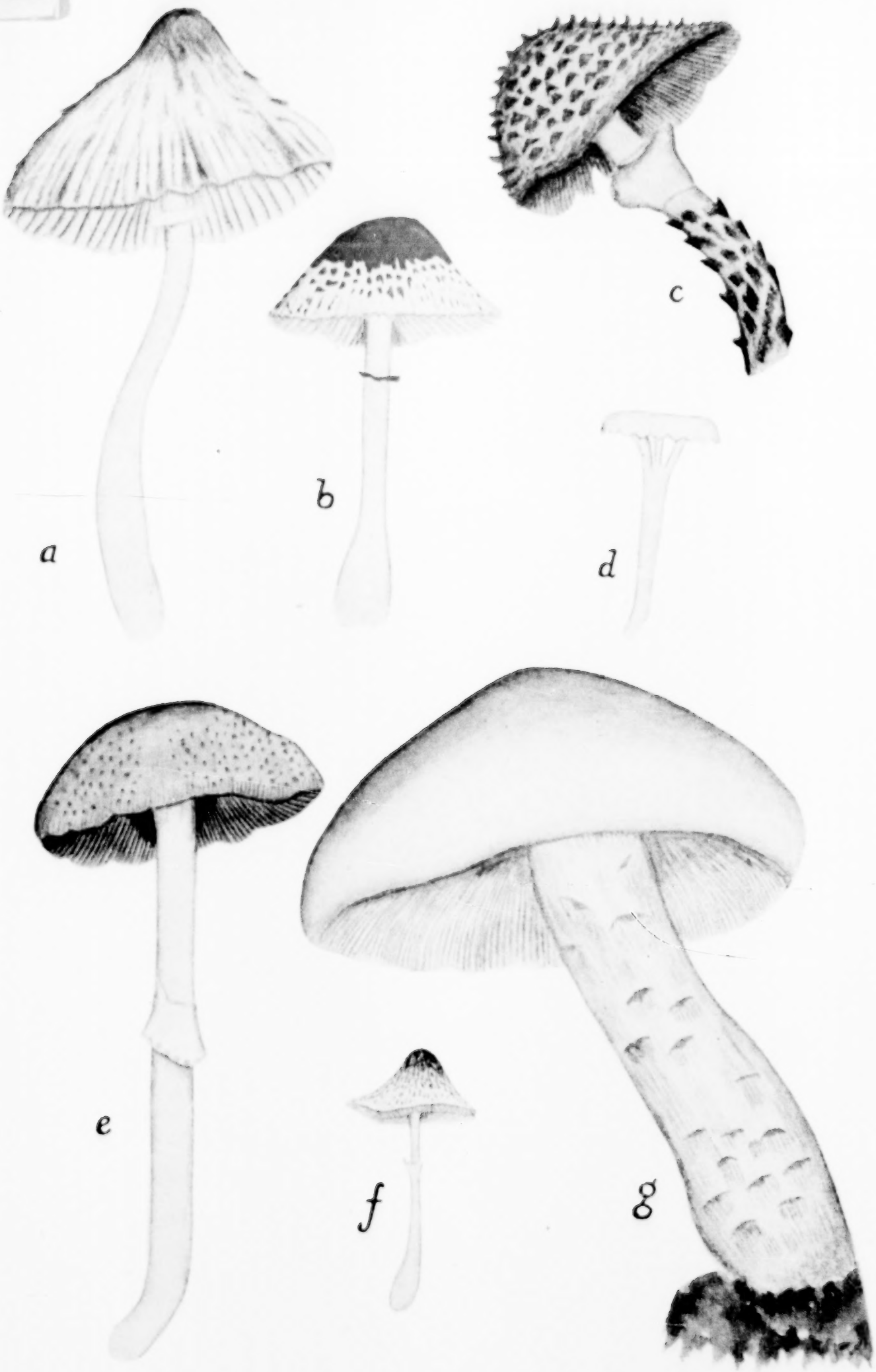
St. Augustine, 18.vii.1947, I.C.T.A. 1481, at the foot of a living *Melicocca bijuga* tree; also seen in the Northern Range forest.

GASTEROMYCETES

Clathrus? ruber Pers., Syn. Fung., p. 241, 1801.

On a rotten tree-stump, J. M. Waterston, 1936, identified as *C. cancellatus* (a synonym). The specimen, which is undoubtedly a *Clathrus* but not

842



a. *Lepiota longistriata* Peck
b. *Lepiota rubrotincta* Peck
c. *Agaricus violaceo-squamulosus* Baker & Dale
d. *Omphalina subscyphoides* Murr.
e. *Stropharia caespitosa* Murr.
f. *Lepiota micropholis* (Berk. & Br.) Sacc.
g. *Tricholoma pachymeres* (Berk. & Br.) Sacc.

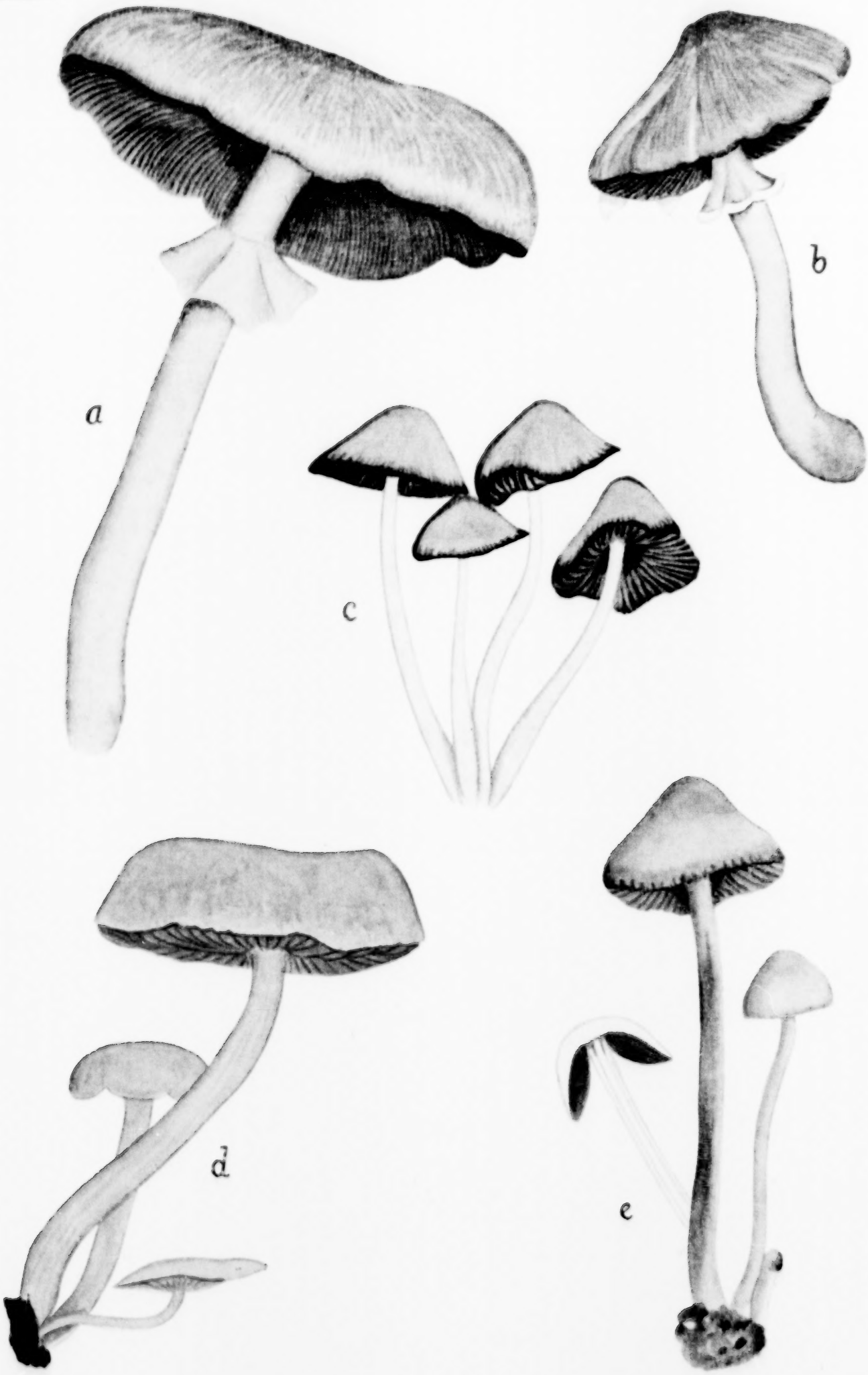
843

a. *Hydnum bambusinum* Baker & Dale
b. *Nolanea fragilis* Baker & Dale
c. *Clitocybe microspora* Baker & Dale
d. *Paxillus atrotomentosus* (Fr.) Fr. var. *bambusinus* Baker & Dale
e. *Pluteus cervinus* (Schaeff. ex. Fr.) Quél. var. *bambusinus* Baker & Dale
f. *Omphalia bicolor* Baker & Dale
g. *Nolanea howellii* Peck
h. *Hygrophorus cantharellus* (Schw.) Fr.

844

a. *Agaricus trinitatensis* Baker & Dale
b. *Marasmius tageticolor* Berk.
c. *Entoloma murraii* (Berk. & Curt.) Sacc.
d. *Dictyopoca rhyssophylla* (Mont.) Baker & Dale
d_1. Details of gills of *D. rhyssophylla*

845



a. *Agaricus xanthoderma* Genev.
b. *Agaricus johnstonii* Murr.
c. *Psathyrella trinitatensis* Baker & Dale
d. *Flammula aureobrunnea* (Berk. & Curt.) Sacc.
e. *Panaeolus cyanescens* (Berk. & Br.) Sacc.

INDEX OF FUNGI Vol. 2 Diagnoses